VOLUME XCIII NUMBER TWO

THE NATIONAL GEOGRAPHIC MAGAZINE

FEBRUARY, 1948

PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
WASHINGTON, D. C.

$5.00 A YEAR 50c THE COPY

Vol. XCIII, No. 2 WASHINGTON FEBRUARY, 1948

THE NATIONAL GEOGRAPHIC MAGAZINE

Haunting Heart of the Everglades

By Andrew H. Brown

BIG BRAKES on four war-surplus bomber tires ground our Glades buggy to a sliding stop.

"There they go—into the high grass!"

I jumped down from my seat, climbed to the snake box in the back of George Espenlaub's swamp chariot, and stepped up to the cab roof. Two buck deer had sprung from the trackless Everglades ten yards ahead. They dropped out of sight in a swale.

"I'll beat the marsh and try to flush them," George proposed. "Maybe they'll run out past the buggy."

My companion pushed through head-high saw grass, flailing the thick growth with a stick. Suddenly the graceful animals bounced up almost from George's feet. They fled across the prairie, two tawny blurs with bobbing white "taillights."

The bounding deer gave the crowning touch of life to flat, rippling grasslands. Dips in the plain cupped mirrors of rain water floating white water lilies and edged with wild iris. Cloud castles billowed in a hot blue sky.

Wild Land of Swamp and Cypress

Our vantage point was deep in the wild heart of south Florida's Everglades, that alluring expanse of swamp and savanna, cypress head and hammock jungle, which Miamians jestingly style their city's 4½-million-acre backyard.

Technically, the Everglades are a broad sweep of saw-grass plains curving around the southeast side of vast Lake Okeechobee and extending south to Florida Bay and the Gulf of Mexico.

By freer interpretation the name "Everglades" takes in Big Cypress Swamp and Okaloacoochee Slough and hence most of Florida south of Lake Okeechobee.

During late winter and early spring of 1947 Willard Culver, National Geographic photographer, and I wandered foot-loose in this greater area.

Natural conditions long hampered development of the Everglades. Today, onetime "impedimenta" are being turned to man's benefit.

Water control has opened thousands of acres of black earth to truck crops. Sugar cane thrives on the peaty nitrogenous soil. Drier flatlands have been cleared for pasture. Remote sloughs are yielding hidden riches of pine and cypress timber.

Big stretches of the country devoid of economic value are being set aside for water and wildlife conservation—and for recreation.

The Nation has recently received a magnificent "gift," Everglades National Park, which President Truman dedicated on December 6, 1947. Twenty-eighth such public reserve, it is the only subtropical national park in the United States. A new three-cent stamp has been issued to celebrate the event.

Justified at last were the vision, faith, and unrelenting efforts of 81-year-old Ernest F. Coe, Director of the Everglades National Park Association. For 20 years Coe fought, often single-handed, for creation of a national park in south Florida's unique wilderness.

The Everglades National Park Commission also was instrumental in making the park a reality.

Limits of the park eventually are expected to embrace most of Florida Bay, including nesting keys of the striking, but scarce, roseate spoonbill (Plate IV). The park's preliminary 710-square-mile area takes in a broad patch of the tip of Florida south of the Tamiami Trail (map, page 149).

About half the protected region is marshy grasslands and the rest mangrove swamps

Ernest Dessauer from Miami Daily News

To Picture an Air Plant, the National Geographic Photographer Shinnied up a Cypress

Willard Culver reaches for the camera passed up to him by the author, Andrew H. Brown. The bushy epiphyte, left, is one of thousands that bedeck trees in the western Everglades (Plate V).

veined by blue tracery of lakes, rivers, and tidal channels.

We struck out for the park area from Homestead, swaying down the narrow road towards Cape Sable, ultima Thule of mainland Florida.

Roads and Canals Are "Siamese Twins"

In the Everglades, road and parallel canal are inseparable. To build a highway in this soggy land you dig a ditch (which fills with water as fast as you shovel it out) and throw up the excavated rock (limestone lies everywhere just below the surface) in an embankment to form the new roadbed.

A clear, cold sunrise found us outward bound from Coot Bay on the Fish and Wildlife Service patrol boat, *Osprey*. We were off on a 100-mile cruise to Shark River. (Before the park took over, this section was part of the Everglades National Wildlife Refuge.)

At the launch's helm stood big, weatherbeaten Warden Barney Parker. He cants a ranger's felt on the back of his head, rests a generous paunch against the wheel, handles a revolver like one of the James brothers, and has a heart soft as a June sunrise.

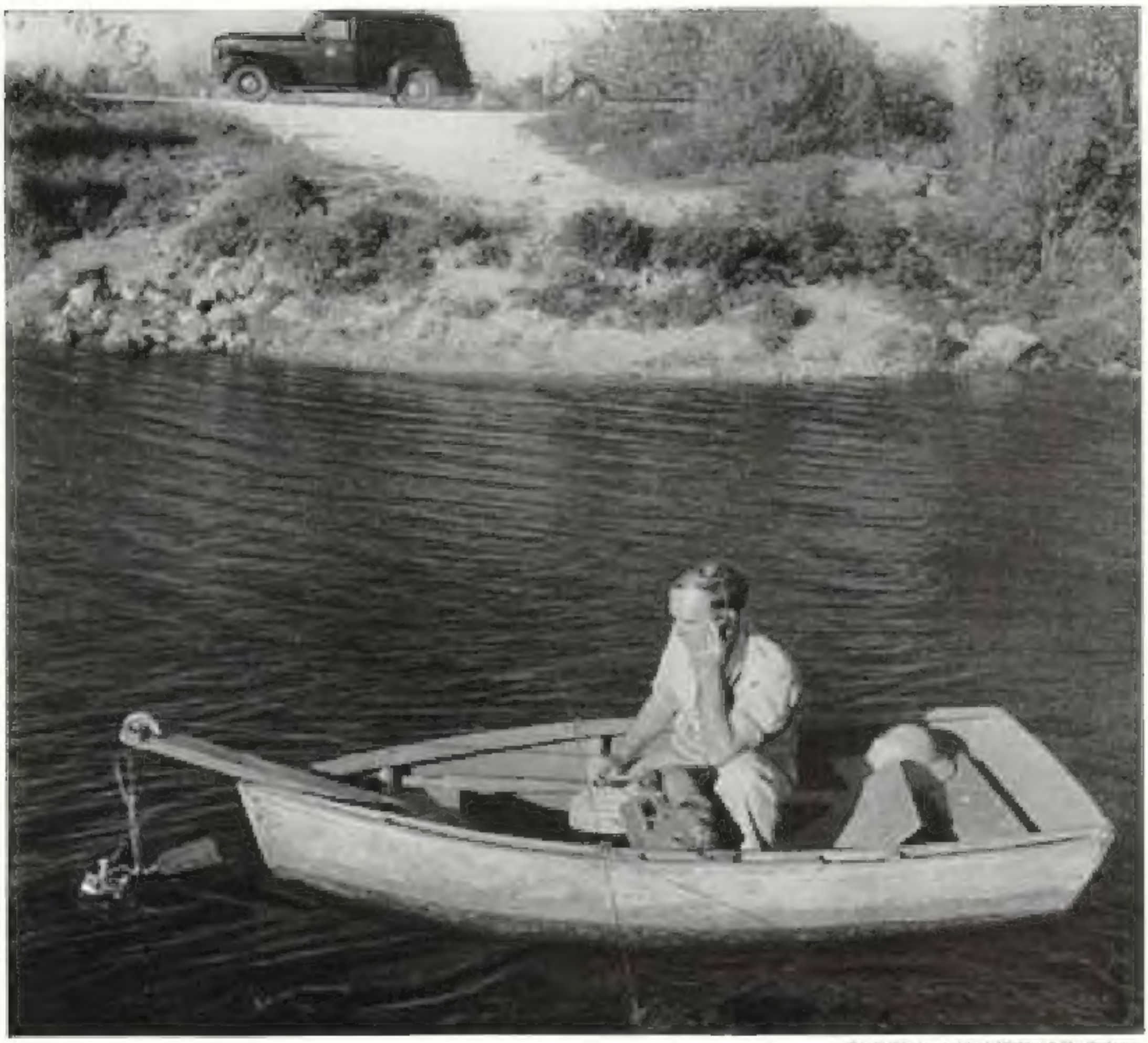
Even Barney has been lost in the maze of winding creeks that patterns this area.

Far up Shark River, where the tranquil stream splits into two reedy branches, we hove to off the Little Banana Patch, a favorite camping spot for a century. Here Daniel B. Beard, then Refuge Superintendent, now Superintendent of the Everglades National Park, and Walter Weber, wildlife painter, set up a base camp to use while Walt sketched birds in their native habitat.*

A few banana trees, planted long ago by Indians, name the place. Under a vine-hung Ficus tree was a flat site for a tent (Plate I). Giant ferns gave Weber and Beard a soft foundation for the floorcloth.

Leaving Weber and Beard to feather their new nest, Barney, Culver, and I whisked upstream in the outboard dinghy. A big alligator slid off a mud bank (page 172). The winding creek unveiled an amazing abundance of birds.

* Walter Weber's paintings of wildlife of southern Florida, with descriptive text, will appear in a subsequent issue of the National Geographic Magazine.



Staff Photographer Willard R. Culver

Through Headphones He "Hears" How Much Water Flows Past

His boat held in place by a cable, a hydraulic engineer of the U. S. Geological Survey counts clicks caused electrically as the current of Miami Canal turns the rotor suspended from the boom (left). By taking readings at varying depths and at several stations across the stream, the technician computes the volume of fresh water passing this point. Geologists recommend keeping selected areas of the Everglades wet, by use of control dams on drainage canals, to help maintain a high water table along Florida's populous Atlantic coast.

Flushed by the whine of our motor, clouds of hundreds of snowy egrets, white ibis, little blue herons, and Louisiana herons rose from trees along the stream. They flew upriver ahead of us, alighted again, only to flap away when we buzzed around the bend (page 171).

Lesser numbers of ducks, wood ibis, white pelicans, black-crowned night herons, cormorants, anhingas, skimmers, kingfishers, and grebes added to the rich variety of this ornithological field day.

Indian Villages Flank Tamiami Trail

Returning to Miami, we drove west across the waist of the Everglades.

Our highway was the famed Tamiami Trail, the name a contraction of Tampa and Miami, terminal cities of the 270-mile-long nature-way (page 150).

Apart from the road, planted Australian pines, and canal there were few signs of man's intrusion. We visited Seminole Indian villages which stand opposite the infrequent filling stations (Plate III).

Colorful natives, descended from survivors of the Seminole War of bitter memory, lived much in the manner of their more aloof cousins back in the bush.

Facing the highway were counters laden with cypress boat models, with multihued aprons, capes, and skirts, with dolls fashioned in their makers' image.

Just east of the boundary between Dade and Collier Counties saw-grass prairie merged

Staff Photographer Wilfred S. Cutler

A Mechanical "Mole" Digs a Pipeless Conduit to Drain and Water Fields

A tractor pulls this caterpillar-tread device across vegetable fields near Lake Okeechobee. The worker lowers the thin vertical blade, at the bottom of which is a torpedolike cylinder closed at the forward end. As the caterpillar clanks along, the blade cuts the soft muck as a knife slices cheese, and the cylinder burrows through the ground two to three feet below the surface. In its wake it leaves a tunnel of the same diameter as the "mole." Soil here is so adhesive that the excavated tube does not collapse and may last for years. Spaced at intervals across a field, these subterranean channels drain farm lands that are too wet, and irrigate the soil from canals when drought prevails.

into open woods of scrub cypress and scattered palms, like parkland. Then the road plunged into real forest, mostly cypress, but with more and more palm and pine as we rolled west (page 146).

We came to the remote and shady town of Everglades (population 515), seat of Collier County, just as a fleet of brightly trimmed sponge boats chugged up the sweeping curves of Barron River (Plate XVI).

It was a warm sunny evening with a skyful of fluffy clouds. I watched the return of weary but triumphant anglers, guests of the famous Rod and Gun Club, sport fishing center for the Ten Thousand Islands region.

A gleaming tarpon tipped the scales at 40 pounds. Snook, redfish, red snapper, amberjack, and other kinds lay on the sea wall.

County Named for Car-Card Booster

Collier County, established in 1923, takes its name from Barron Collier of streetcar-card advertising fame, who bought up tens of thousands of acres of southwest Florida in the

Drawn by Theodore Price

A New National Park Protects a Wild Stretch of the Everglades; Adjacent Lands, Unreclaimed Swamp a Generation Ago, Yield Lumber, Crops, and Cattle

Everglades National Park is 710 square miles of marshy prairies, mangrove thickets, and cypress swamps fringed on the seaward margins with tidal rivers, lakes, and bays. It is the only subtropical national park in the United States. The recently dedicated reserve will afford refuge for nesting colonies of egrets, ibises, herons, and other birds decimated in the past by ruthless hunting. Visitors also may see deer, alligators, snakes, bobcats, and turtles. The region features strange and beautiful trees and flowers, including air plants and wild orchids (Plates V and VIII, and page 146).

early twenties. The Barron Collier Interests helped complete the Tamiami Trail, and planned a second Miami Beach on Marco Island, a project still in blueprint stage.

The Collier Interests' land holdings of one-and-a-quarter *million* acres (an area the size of Delaware) include 60 percent of Collier County and overlap into adjacent Lee and Hendry Counties.

D. Graham Copeland, recently retired resident manager of the Collier Interests, listed the sources of Collier County's income in order of importance: wood products (mostly pine and cypress lumber), early truck crops, commercial fishing, cattle ranching, and tourist trade. Only producing oil wells in Florida are at Sunniland in the north of the county.

Collier County was the scene of last engagements of the Seminole War. To document early events, Copeland has assembled a six-foot pile of reminiscences, statements, newspaper clippings, and letters. I was allowed to look through this absorbing material.

Staff Photographer Willard R. Culver

Telephone Poles, Road, and Canal Seem to Merge in the Flat Distance of the Everglades

From Miami on the Atlantic coast to Naples on the Gulf of Mexico there are no sharp turns and only a few tiny hamlets to slow down traffic speeding across the Tamiami Trail. The highway (named by contraction of Tampa and Miami, its terminal cities) was completed in 1928 at a cost of $8,700,000.

Andrew H. Brown

Grass Higher than a Man's Head, Stretching to Horizons of the 'Glades, Ripples Like Wheat in the Wind

Among the region's memorable characters was Juan (Old John) Gómez, claimed by many to have been a pirate with Gasparilla. When he died early in the 1900's, estimates of his age varied from 115 to 137 years!

Born a Roman Catholic, he became a Methodist at the age of 110 or 115. The local minister was so impressed that he designated every fifth Sunday of months that had five Sundays "Gómez Sunday." On those days Methodists of the vicinity piled into boats and went out to worship at Gómez's home on Panther Key.

An article in the *American Eagle* of Estero, Florida, published on January 20, 1927, added these details: "He (Juan Gómez) had heavy calluses on his feet and could run across an oyster bed as comfortably as on a hardwood floor. He was uneducated but spoke seven languages. . . . He declared when his age was discussed, 'God has forgotten me; it is past my time to die.'"

Reckless Harvest of Birds and Gators

"Wildlife was incredibly abundant hereabouts last century and even in the early part of this one," Copeland attested.

"Early settlers told me of shooting enough plume birds in one day to furnish aigrettes worth $500, then in demand to decorate women's hats. Plume hunting was prohibited by law in 1891, but there was no attempt at enforcement for years after that. I heard of hunters slaughtering 77 deer in one drive, and 135 alligators in a single mudhole."

Some men only pulled the gators' teeth. For these ivory fangs, used for watch fobs, earrings, charms, bracelets, and other gewgaws, the reptile dentists got from $1 to $5 a pound.

Mr. R. B. Storter of Naples told me: "I carried over 10,000 alligator hides to Tampa in February, March, and April of 1898. They were shipped to Boyer Brothers in New York. About 1,000 of the skins were taken from Roberts Lake alone—one of the most fabulous gator 'mines' in the country.

"That was an unusually dry year, and the big creatures collected in places where water could be found. Crowded in small areas, they were easy victims of hunters."

Egret shooters would search for rookeries. When they found one, they ruthlessly wiped it out—destroying up to 15,000 birds.

On near-by Chokoloskee Island, C. S. (Ted) Smallwood, island patriarch, led me cheerfully up and down dim aisles of his big store. It stands on pilings above the tide wash. Counters and shelves bulged and overflowed with masses of jumbled merchandise in a picture of country-store abundance the like of which I had never seen. He cut me a generous slab from a huge wheel of yellow cheese.

"I've turned over the shop to my children," he said, introducing two daughters, a son, a son-in-law, and two grandchildren.

Smallwood, whose keen blue eyes give the lie to his 74 years of age, led me over the heart of the strange island. Little sand and shell-mound hills framed the steepest landscape I had yet seen in south Florida.

"Once I had a lot of good fruit trees." My guide turned back the years. "Most of them have gone to seed."

Like a friendly old pirate, Smallwood favored one leg as he climbed firmly up and down the hillocks, showing off scattered wind-tortured guavas, avocados, olives, papayas. Shade trees were native gumbo-limbos, palms, and Australian pines he planted long ago.

I met 90-year-old Susan McKinney, whose late husband, C. G. McKinney, opened the first general store on Chokoloskee Island in 1886. A sound, if firmly negative, business policy used to be emblazoned on his billhead: "No Banking, No Mortgaging, No Insurance, No Borrowing, No Loaning. I must have cash to buy more hash."

North from the Tamiami Trail, the Immokalee road, State Route 29, bisects Big Cypress Swamp, then straightens and arrows through range land to meet the Fort Myers-West Palm Beach road.

Big Cypress Going Fast

East of Route 29, lumbering is gobbling up big chunks of mixed pine and cypress forests. West of the highway, in the almost impenetrable Fakahatchee Slough, a long strip of virgin cypress is the largest remaining single stand in the United States.

A black plume of smoke from a tall stack guided us to the Copeland camp of the Lee Tidewater Cypress Company, which owns most of this magnificent forest.

J. R. Terrill, logging superintendent, showed us the operation.

We saw one of the semiweekly 40-car trains puff out of the yard, hauling away 400,000 board feet of huge rusty-hued logs to the sawmill at Perry in north Florida. Weather-resistant cypress is in demand for siding, shingles, and wood trim as well as for paneling and other interior finishing.

Terrill piled us on a gasoline speeder and we rattled up the line into the woods. Gray stumps dotted a logged-over area, where thick vines trailed on the ground.

"The fallers claim the vines are so tough," Terrill said with a smile, "that if one clings

Kodachrome by Willard R. Culver

A Famed Wildlife Painter Studies Wing Detail of an Egret, Once Hunted for Its Plumes

Walter Weber inspects an American egret picked up dead from Shark River, deep in Florida's Everglades. The artist made sketches for bird and animal paintings especially for the NATIONAL GEOGRAPHIC MAGAZINE.

A Power Derrick Places a Giant Clump of "Pickup-Sticks," Flowers Red Hogs Cypress Logs Out of Lake Pelchartrice Slough

Car and Passengers "Retired" Together in Mid-Ocean Glass — Beyond the Famous Trail Serenade Indians Welcome Travelers to Their Village

Snowy Roseate Spoonbills (the Adult Wounded Pink with Common Pinkies) Growing Mangrove with a Lovely Breeze

Lounging Smokers, Bareheaded Keepers Drive Bears

Red-spread Ape Hunts Are Monotone "Dances Gorgeous"

Harness Race and Chariot Racing, Steam Cane to Sugar 19th Process Lantern Just Before Stalks Are Harvested

Steel Claws Dump Bituminous Coal into Tractor Wagons. Rail Cars Will Carry It the Last Lap to the Sugar Mill

A Cambodian Lady Writhes Sideward from Shell Mounds While a Digger Probes for Relics

Sledlike Craft Push Air to Speed Through Water Only Inches Deep

[illegible]

An Air Force Rescue Dragster over Grass Sledlike craft Across Open Water

[illegible]

Some Turns the Scouts Made to Keep Many Miles a Secret

Proud of His Fine Saddle, a Scout Leaves Behind a Jubilant Press

"Ten Little, Nine Little, Eight Little Indians" Fine School Can Be Fun

"Earliest You Can Dim Papers Go Home at Night to Forebears" Alternate Ways of Life

Straight-backed Seminole Woman Prepares the Evening's Food with Dinnity and Grace

Stolid Face Softens as a Junior Tribesman Shares Her Lunch

Chinese Cypress Works the Skill of Age into a Box

Everglades Cattle "Were Lapping Blackstrap Molasses with All the Gusto of Prohibitionists Lapping up Watermelon"

[illegible]

A Wildlife Refuge Superintendent Sadly Photographs Gulcer Glass — Tangled Mangroves along Shark River

Fresh-cured Pecos Festoon the Gulf Sponge Fleet, Moored in Tarpon Row

to a big 40 stretch from woods to camp without breaking!"

We reached the cutting area. A high line run from a skidder was snaking fat trees out of jungle so thick we could see only a few yards into it. Native royal palms lifted 100-foot tall green crowns (Plate II).

"It would give a rattlesnake a headache to try to run in that bush," the speeder driver commented.

We watched a team of fallers topple a big cypress with a double-handled saw. With a sound like close thunder the soaring giant crashed through lower growth to smite the ground with a booming thud.

"That one is between 500 and 750 years old," stated Terrill. "Not a very old one. It's surprising how sound and healthy they are, after standing up to their knees in water all their lives—and without their rubbers."

As we came out of the swamp, Culver asked, "Isn't it hot and miserable in the woods in summer?"

"Well, the heat's bad, but the bugs are awful," Terrill replied. "One man's whole job is just to sweep flies off the backs of the men operatin' the levers on the high line.

"Horseflies get so thick in late April, if you're setTin' on a screened porch, you can't [illegible] I know a man whose chicken run was beside a street light. Horseflies and other bugs flew into that light at night and fell so thick, he didn't have t' feed his hens for two-three weeks!"

Reservations Are Indians' "Kingdoms"

That evening we drove northwest to Fort Myers where we looked up Kenneth A. Marmon, Superintendent of the Seminole Indian Agency.*

Marmon offered to show us the two major Seminole Indian reservations in south Florida: Brighton, northwest of Lake Okeechobee, and Big Cypress, 30 miles south of the Lake. On the latter reserve 90 to 120 Indians live on 42,603 acres—or 356 acres, minimum, per Indian!

These lands are the Indians' exclusive hunting and cattle grazing domain.

Of the 700 Seminoles in south Florida, only 42 are mixed bloods. About 15 or 20 percent understand English. Some won't talk the white man's language, but they understand it well enough.

Receiving no dole, proud aborigines must work for their living. Many, therefore, have left the reserves to get jobs ranging from wrestling alligators in Miami animal exhibits to cutting sugar cane, and picking tomatoes, beans, and fruit crops. Others work on ranches or in lumber mills, drive trucks, or sell handicrafts along the highways.

In 1936 Florida's Governor Fred Sholtz and his cabinet met an assemblage of 275 Seminoles and asked them what they would like from the white man.

After a brief huddle, the native spokesman answered succinctly, "Just let us alone!"

"We have high hopes for cattle raising on the reservations," Marmon told us. "We've undertaken the range program to improve the Indians' lot.

"The Seminoles face a dilemma," Marmon explained. "Instinct and custom make them cling to the traditions of their ancestors, while civilization knocks at their door, urging them to join the big parade of progress."

[illegible] March [illegible] cattle on Brighton Reservation. Marmon drove us out to see 2,000 Hereford cattle run through the tick killing bath.

Crisp Beef Spareribs—Delicious!

Lunch break was half over when we drove up to the camp. Great fire-crisped hunks of fresh beef spareribs were proffered us by Fred Montsdeoca, white extension agent who supervises all cattle operations. Live-oak firewood imparted spicy flavor to the meat.

Plump, cheerful Seminole women, clad in their usual modest, rainbow-colored capes and vast skirts, brought us hot biscuits and black coffee. A coonskin stretched on palmetto ribs hung on a near-by tree. Tripe from the steer whose flesh had fed us was drying in the sun. Lunch out of the way, the women got busy on bead bracelets and dolls' clothing.

"At present we have a tribal herd," Montsdeoca said. "Everybody has an equal interest in it. Our aim is to build up the herd to a level that'll allow us to deal out a number of animals—say 20 head—to individual Indians."

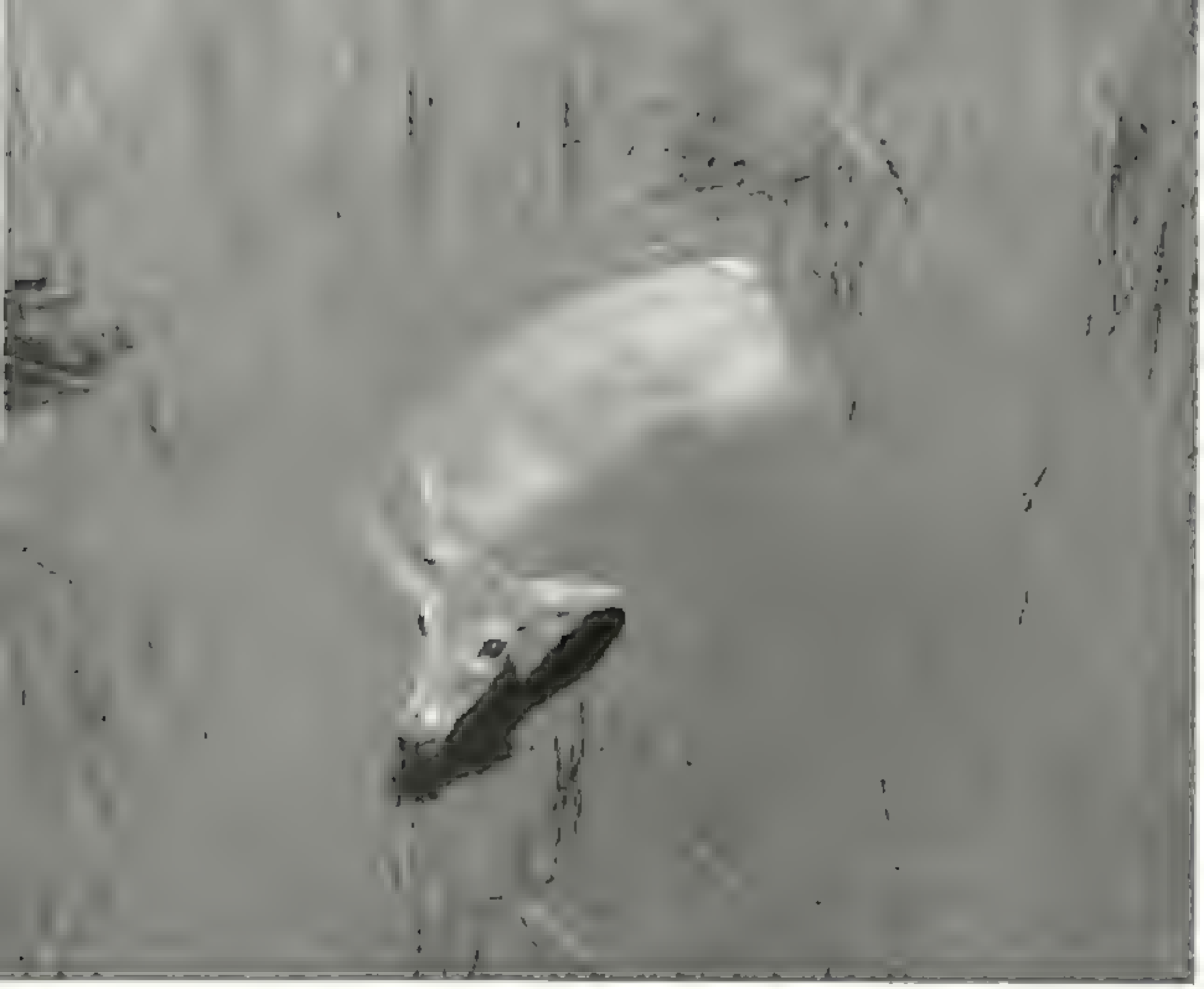
We met Charlie Micco, Frank Shore, John Josh, and John Henry Gopher, Seminole trustees of the cattle enterprise. They were appointed by the tribe and approved by the Commissioner of Indian Affairs.

"Indians make fine cowboys," Montsdeoca commented. "They take naturally to horseback and are fearless riders."

We watched the slim, wiry men rounding up the cattle. They wore checked shirts, broad-brimmed hats of felt or straw, boots and spurs, dungarees and neckerchiefs, like any Western cowpoke (Plate X).

Sunset silhouetted islands of cabbage palms

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Indians of the Southeastern United States," by Matthew W. Stirling, January, 1940.



When Rains Flood the Glades, a Deer Needs Wings or Fins

[illegible] The Indian [illegible] into a trail and followed [illegible] time their [illegible] with the [illegible] straight-backed state of [illegible] saddle.

Another day Marmon led us 30 miles [illegible] of Lake Okeechobee through Cypress [illegible] slough to the second Seminole reservation in the Big Cypress Swamp.

The primitive road grade was washed out, so we plunged across the open countryside navigating by tree clumps and larger ponds and sloughs.

What a ride!

A young Seminole buck, Willie Tommie, [illegible] over a trail half-submerged in recent rains. Willie got as there and back, proving as tireless as his pathfinding for deers.

Far from towns or traffic, the pattern of life was primitive but peaceful. An Indian mother [illegible] cut from her family's clothing on the shore of a pool. Another woman pounded corn to meal with a cypress pestle in a mortar cut from a live oak log. Everyone went barefoot, from [illegible] to most ancient [illegible] matriarch. Thin and friendly [illegible] dogs roamed at will around the camp. (Plate XIII.)

Between La Belle and Lake [illegible] we were wizarded from the Everglades [illegible] pine, cypress swamp and saw-grass marsh, to what looked like rangeland of eastern Wyoming. Cattle by the thousand, many of them pearl-gray Brahmans, grazed on the land that had been cleared almost to the last palmetto patch.

Brahmans, introduced from India, are remarkably tolerant of heat and resistant to [illegible].

Horseback carried us across the distance to tie up at west [illegible] cattle camps. At a modest ranch [illegible] a visit with one of the leading [illegible] cattle men [illegible] 100 acres (there [illegible] small about [illegible] country!), Joe B. [illegible] runs about [illegible] head of cattle.

An American Egret (Egretta Egretta) Deftly Flips a Small Fish into Position for Swallowing

[illegible] mate has all the luck. The yellow [illegible]

Wildlife [illegible] crops, and sugar [illegible] the Everglades are [illegible] prophets of gloom who called the [illegible] The future is evoked with caution however, for in many sections thin soils, fire [illegible] and vexing water control problems [illegible] on landlords' rosy dreams.

Land Suffered from Overdrainage

Land use history in the Everglades [illegible] identified [illegible] "Before Canals" land was too wet to cultivate. "After Drainage" it sometimes was too dry.

In the last 40 years, and particularly between 1913 and 1929, the Everglades were furrowed with hundreds of miles of [illegible] canals. Drainage was over-[illegible] from the farmers' point of view. [illegible] today are check dams and locks which promise better balanced water control (page 147).

[illegible] operator in south Flori-

[illegible] the United States Sugar [illegible] Lake Okeechobee. The U. S. C. is the [illegible] United States (Plates VI and VII).

[illegible] around the lake shores, the company [illegible] 150,000 acres [illegible] A fifth of these [illegible] are in sugar cane production.

[illegible] sugar every [illegible] Josiah Ferris, Jr., informed me (before the end of sugar rationing), "to cash the civilian ration coupons of every man, woman, and child in the United States for [illegible] days."

[illegible]

[illegible] cattle pasture and agricultural [illegible] than sugar cane. For Newport Industries, Inc., it grows ramie, versatile "new" fiber that seems destined for large-scale development for

Motionless as a Floating Log, a Big Alligator Lies in Wait for Unwary Waterfowl, Fish or Small Mammals

[illegible] choose about his diet: [illegible] that flies, walks, crawls [illegible] in Everglades. [illegible] paper and [illegible]

A [illegible] Land [illegible] east west of [illegible] Home of Moonshine [illegible]

"What [illegible] making molasses?" [illegible]

[illegible]

Astride [illegible] Ferris followed the jeep I shared with the head rancher. We took a sack of cottonseed pellets to throw as bait to the bovines.

[illegible] Sugar [illegible] purchased [illegible] acres of [illegible]

Truck Gardening Is Big Business

Agriculture has boomed all around the north and east shore of Lake Okeechobee ranger with a broad band of deep, organic muck. Bumper winter [illegible] ery [illegible] pepper [illegible] dant. [illegible] potatoes and [illegible] manually [illegible] wealth and work in this thriving region.

Farming still [illegible] bowers [illegible]

[illegible] south Florida winter truck crop [illegible] Belle Glade one of the largest vegetable [illegible] ping points in the United States.

[illegible] Everglades [illegible] lands [illegible] Last season, 13,000 carloads of fresh vegetables [illegible] the Lake area alone. Truck shipments [illegible] the totals cleared to hungry markets.

R. V. Creech, Belle Glade farmer, took me out to black-soil fields where workers were cutting the last of a whopping crop of Pascal and Golden celery. They were taking out 700 crates to the acre!

George Espenlaub of Clewiston guided me to ancient Calusa Indian remains "lost" in the Everglades south of town.

The pre-Seminole Tony Mounds rise only five to ten feet above surrounding flatlands. Built along one of their canoe routes by aboriginal Calusas, the primitive earthworks are eroded and grass-grown.

Returning, "we" captured alive a three-foot cottonmouth moccasin with snake hook and bare hands. (My part in this exploit was simply to "let George do it!")

George regaled me with yarns of snake-hunting trips. He sells reptiles to live snake exhibitors.

Capturing Snakes by the Mile

Later, in Miami, I met a man who lives on snakes—not eating them, but selling them, made up in handbags, shoes, hats, belts, and wallets.

Edward B. Mulloy, owner of the Florida Reptile Craft Company, does a volume trade [illegible]

"Last year," he told me, "I handled over seven miles of snakeskins, mainly cottonmouth moccasins, green and banded water snakes, and king snakes. They have the handsomest patterns and are very strong.

"On a five-day trip, with two helpers and three days of hunting," Mulloy calculated as he spoke, "a good catch would be 900 snakes. It's a fair take if we get 3,000 feet of skins."

"How do you catch 'em?"

"We capture all except rattlers and kings at night, spotting our quarry with lights strapped to our foreheads. We pick up snakes in the water with tongs like the grocery hook the clerk uses to pull down boxes of cereal. On land, we press down on the snake's neck with the curved wire head of a T-stick, then grab him with thumb and forefinger."

"If you get stuck in the swamp and run out of grub, what can you eat?" I inquired.

"Well, most wild pig is nice. I've killed them with bow and arrow. Spearing frogs is easy, and their kickers are mighty sweet.

"In canals and sloughs we jump soft-shelled turtles. Tail of gator makes good stew [alligator hunting is legal in many counties], and I wouldn't pass up rattlesnake filets.

"Heart of cabbage palm, cooked or in a cold salad, soothes my palate. And in season wild turkey and deer are not too hard to come by. Then, if you like fish . . ."

"Stop, please!" I implored. "My mouth's watering!"

Lyle Davis, at that time district conservationist of the U. S. Soil Conservation Service, wanted us to see the Hillsboro Marsh area west of Delray Beach, a "wilderness" area scheduled for protection as a wildlife refuge.

"How do we get around out there?" I asked.

"We have a brace of air boats," Davis said. "They can step over that half-drowned grass."

On the "shores" of a vast swamp we met the air boat, water plane, or "whoo-boomde." This is a flat-bottomed, square-ended craft with an old auto engine mounted astern in a latticework of bars and struts (Plate IX).

The motor drives an airplane propeller which blasts air backward and thus shoves the boat forward (at speeds up to 50 miles an hour). It took both craft to hold our party. Our pilots were old hunters, Lewis ("Cal") Henderson and Johnny Lamb.

From a narrow reedy channel we suddenly burst out upon the open marsh. A film of water lay on the land. From the saw grass wild canna lifted dry flower clusters. Islands of myrtle, bay, and Florida holly framed lakelike expanses strewn with water lilies.

Lamb and Henderson opened the throttles. Like huge angry water bugs the yellow air [illegible] across the shallows. White wakes foamed to either side.

"The Ashley gang of bank robbers hid out here," Johnny Lamb shouted. "They were never caught till they went outside.

"Recently as the early twenties," Davis added, "if you ran into a stranger in these swamps, you didn't just casually ask his name. If he volunteered his moniker (O.K.), cut it probably wouldn't be his right one, anyway."

Weeks before, an old Seminole headman had given us a placid ride in his cypress-log canoe, vanishing symbol of the Everglades. Now here we were skating along in an ingenious travel contraption at 45 miles an hour!

While the whooshmobile trip certainly was top for speed, zing, and thrills, it ran a poor second to the cypress pirogue for a quiet, restful cruise.

Perhaps the contrast epitomized the Everglades, where the new Everglades National Park strives to restore "waste" land to unspoiled conditions of 60 years ago, and where farmers and ranchers rush production of cattle, truck crops, fruits, fibers, and sugar cane.*

* See "In the Narrows of Geography," Magazine [illegible] "The Fountain of Youth," by John Oliver [illegible] "Since January, 1565," "South Florida's Amazing Everglades," by John [illegible] Reilly, January, 1940; and "How We Use the Gulf of Mexico," by Frederick Simpich, January, 1944.

Northwestern Indians Built Hewn-plank Houses Long Before the White Man Came

A Nootka girl [illegible] years old lives in such a house in southern Alaska. From there to Mexico, native women hold a place [illegible] for their [illegible] houses. Well-[illegible], [illegible] to [illegible] women [illegible] to the [illegible] [illegible]

Indians of the Far West

By Matthew W. Stirling *

Chief, Bureau of American Ethnology, Smithsonian Institution

By the time the Western Plains and the foothills of the Sierra Nevada the traveler gazes down from his high-flying plane upon what seems to many a panorama of complete desolation—the great American desert.

Mile after mile of saline flats and sage brush plains unfolds west of Great Salt Lake, where a century ago hundreds of covered-wagon pioneers left their homes and those of their oxen to bleach along torturing trails.

The Great Basin was an implacable enemy to white men then. Even now, though crossed by railroads, airlines, and motor highways, much of it seems unfit for habitation by man or beast.

Indians Prospered Where White Men Starved

Yet from this forbidding inhospitable waste, a generation before the white man came, some 10,000 Indians wrested a living and in their way prospered.

They did this without agriculture; without irrigation; without tools, save crude implements fashioned from sticks and stones; without horses and cattle; without even adequate clothing or shelter from the severe cold of winter or the blazing heat of summer.

Nowhere in human annals can be found a more striking example of man's adapting himself to an unfriendly environment than that furnished by the tribes of the Great Basin.

The Indians of the Far West, living between the Rocky Mountains and the Pacific coast, were in general the most primitive within the present boundaries of the United States. Of all the Far West tribes, those of the Great Basin, which embraces Nevada, part of Utah, and portions of bordering States, were most backward.

Tribes living in the region drained by the Columbia River and its tributaries had better sources of food and therefore reached a slightly higher level.

In the Pacific coast region between the Sierra Nevada-Cascade Range and the ocean abundant natural resources and genial climate made living comfortable easy.

Unlike the forest-clad and low level region east of the Mississippi River, the Far West is a land of tremendous topographic diversity. For instance, in the corner of the Great Basin, which extends into southern California, Mount Whitney and Death Valley highest and lowest points in the United States, are within sight of each other.

The Indians of the Far West were as diversified as the topography.

They lived principally on nuts, wild seeds, and roots. They had no bufflo to lead them afar on the chase, as had the eastern tribesmen. Rugged topographical barriers circumscribed their movements.

Great Basin Indians belong almost exclusively to one linguistic stock, the Shoshonean. The principal tribes were the northern Paiute of western Nevada and southeastern Oregon, the Shoshoni of central and eastern Nevada and nearby Utah, the southern Paiute of southern Nevada and adjacent Utah, and the Ute of eastern Utah and western Colorado.

Not until about 1840 did the real period of white immigration into the Far West begin, starting with the caravans following the Oregon Trail and the Mormon settlements around Great Salt Lake, this white invasion reached its peak in the California gold rush. The most direct routes traversed the heart of the Great Basin.

Tens of thousands of gold seekers crossed the desert during the years of the rush, but their passing had little effect on the Indians. The white men, sticking to the main trails, were concerned only with their goal beyond the Sierras.

The diaries of these pioneers make little mention of the natives save to call them "diggers," a contemptuous name referring to their root gathering.

Within a few years after the discovery of rich mines in western Nevada prospectors penetrated to every corner of the Basin, and

* This is the sixth in a series of authoritative articles by Dr. Stirling on the American Indian, illustrated with W. Langdon Kihn's paintings. For many years Mr. Kihn has been acclaimed in America and Europe as a distinguished painter of Indian subjects. He was commissioned by the National Geographic Society to illustrate the comprehensive series on American Indians. In earlier days, he traveled to Indian reservations, excavation sites, and were areas populated by Indians long before the white man came, making sketches, studies, backgrounds, models, and jewelry of the tribes shown. Thus the paintings combine artistic beauty with a wealth of authentic information. See, in the National Geographic Magazine, "America's First Settlers, the Indians," November 1937; "Indian Tribes of Public Land," November 1940; "Indians of Our Western Plains," July, 1941; "Indians of Our North Pacific Coast," January, 1945; and "Indians of the Southeastern United States," January, 1946.

in their wake came settlers to occupy the limited watered areas.*

Grazing livestock reduced the edible plants, and the white man began cutting down for fuel the piñon trees, the red man's most important source of food.

With recently acquired horses and guns the Indians put up a stern resistance for a while. But when the transcontinental railroad across Utah and Nevada was completed in 1869, the aboriginal way of life was doomed.

Wovoka, Originator of the Ghost Dance

In this period was born in Mason Valley, western Nevada, a Paiute of lowly origin who became known as Wovoka, "the Cutter." He never left his little native valley. Although industrious and of good character, he was undistinguished as to intellect and was not particularly aggressive.

Nevertheless, in his early thirties he became one of the most influential Indians in North America. From the Gulf of Mexico to the Canadian border pilgrims came to see him in his little dome-shaped tule hut.

Wovoka was the originator and prophet of the famous Ghost Dance movement, which excited great unrest among the tribes of the Plains.

About 1888 Wovoka, already a medicine man of local reputation, had his great revelation. While he lay ill with a fever, an eclipse of the sun caused much superstitious awe among the Indians.

Wovoka believed that his soul had traveled to the spirit world and there consulted with the god of the Indians.

It was revealed to him that the Indians would regain their ancient inheritance and would be rejoined by their departed relatives and friends (Plate III).

Wovoka was given a set of songs and dance ceremonies which he was to instruct the Indians to practice so that they might be ready for the great day of deliverance. He attributed no supernatural powers to himself, but considered that he had been chosen as prophet to herald the coming restoration.

The new movement spread like a conflagration from Nevada to the tribes east of the Rockies, and culminated in the massacre at Wounded Knee and the killing of Sitting Bull in 1890.

Among the American Indians many such messianic movements arose in the wake of white domination. The great Pontiac Conspiracy (1763-65) had such an origin.

Travelers who had encountered the colorful Plains and Pueblo tribes expressed scorn for the lowly Shoshoni of the Great Basin.

They described them as living at the level of animals, always half starved, hibernating without food like bears in caves, whence they emerged in the spring, crawling on hands and knees to eat grass.

In most of the Great Basin rainfall was scanty and food scarce. Summers were extremely hot; winters, extremely cold. The Indian had to utilize every form of food he could obtain.

To the disgust of early observers the Shoshoni ate crickets, lizards, snakes, gophers, and roots. However, since the selection of items of diet is determined largely by custom, a Shoshoni might be just as annoyed at seeing a white man eating a crab or a lobster.

Vegetarians of Necessity

Nuts of the pine tree, or piñon, were the most important food. Abundance of this fall crop determined whether the Indians would pass the winter comfortably or in semistarvation. The entire family participated in gathering pine nuts during a period ranging from 10 to 20 days. If the crop was abundant, an adult could gather approximately 50 pounds a day.

In the southern part of the Great Basin, where the elevation was lower and the climate warmer, the mesquite bean and the agave, or century plant, were valuable foods. Seeds of many grasses, such as wild rye, also were eaten.

Mesquite beans were gathered in the summertime. The seeds were taken from the pods and ground into flour on crude stone mortars.

The agave was prepared in the south by roasting in stone-lined pits. When cooked, the stringy flesh of the plant is almost molasses-sweet.

Big game animals were relatively scarce and hard to obtain.

Families Joined in Jack Rabbit Drives

Over most of the Great Basin jack rabbits were abundant and easily caught. From their skins were made robes, the principal winter garment of the Indians.

The rabbits were usually taken in community drives. Nets made of cords of twisted grass were strung in a quarter mile arc. Entire families spread themselves out in a line. Approaching the net, the hunters beat the brush and drove the rabbits before them into the barrier.

When the unrolled ends of the nets were

* See "Nevada, Desert Treasure House," by W. Robert Moore, NATIONAL GEOGRAPHIC MAGAZINE, January, 1946.

Chief Joseph, Nez Perce Leader, Wallowa Valley, Oregon, 1877

Pueblo Indians Sing and Sway to the Red Man's Version of "Father, Father, Where Go the Buffaloes?"

Boaz Overhears Ruth Into the Peoples' Western Soil Heads His Couple with Promises of Unending Death

[illegible]

Hell on the Columbia: River's Black Basalt Banks Dalles Indians Show Lewis and Clark a Way Through Its White Water

Work That Tools and Patent Still Controls Because Now the New World's Only Thread Comes

[illegible]

[illegible]

Perched on His Ancestral Fishing Stand, a Columbia River Indian Nets Salmon in the Churning Waters of Celilo Falls

Restaurant Ladies and Serving Soldiers Mural in Pevsner's Wanagan Lounge, S. Hess

In the Natural Trenches of California's Lava Beds Where Modoc Made a Better Last Stand

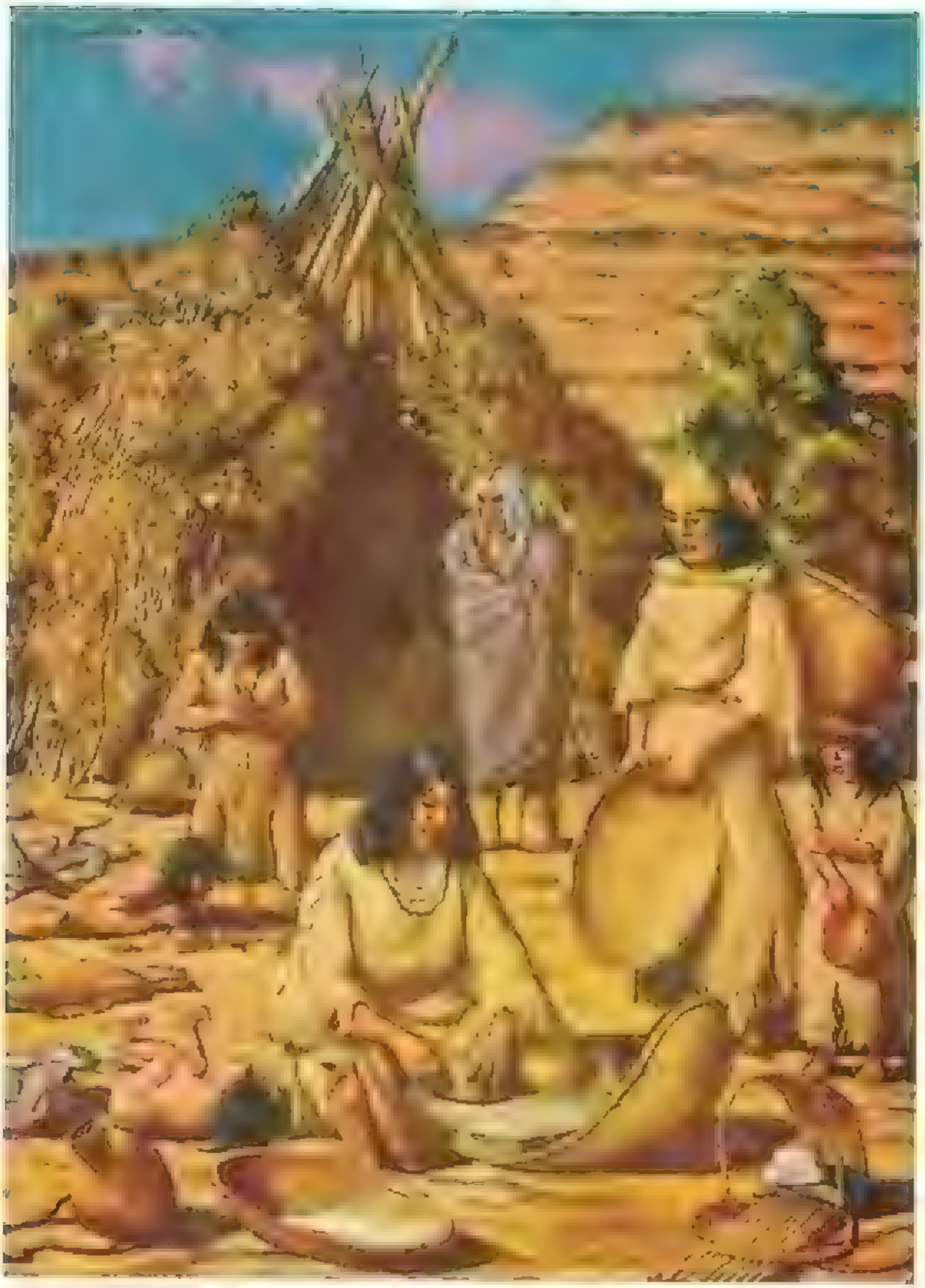
[illegible]

Sticks: Professional Dance Women of Costa Rica Were the Continent's Star Basket Weavers

[illegible]

Viewed in Savage Splendor, Dancers at a Secret Cult Meet Before Their Round House in an Unprogressive Country

[illegible]



Seeds Gathered from Their Semi-arid Plateau Were the Staple Food of Wandering Paiute

[illegible] lands between California's Sierra Nevada and the southern Rockies. [illegible]

Beneath Verdant Palms Stump-tracked Cedar La Warnes Flows under Stacks of Golden Reeds

[illegible]

Unknown pieces Tropa Colonial, Mounted Lancers of the Dear, Ordered in the New Year with by White Decorative Dance

[illegible]

After Mass on Sunday Conversation Continues at the Mission of St. Francis Kept Alive Their Ancient Tribal Dances

[illegible]

Dressed in Beaded Finery, a Navajo Girl Rides High in Her Spanish-type Saddle

[illegible]

drawn across the opening of the arc, they were easily dispatched with wooden clubs.

In another method the hunters carried torches and formed a large circle. The brush was fired to burn toward the center. The hunters converged until they could kill the dazed rabbits with clubs.

Cottontail rabbits, gophers, squirrels, rats, and marmots were also eaten. They were stalked singly and shot with bow and arrow, as were mountain sheep.

The fast and wary antelope was taken in community drives. A stout corral about 200 feet in diameter was built in a valley where the animals were expected. Wide converging wings of brush were put up for the entrance. The antelope, driven by the hunters and guided by the wings, entered the corral and were shot with bow and arrow.

In long-past geologic ages the Great Basin was a region of lakes and lush forests. When man first entered the scene we do not know, though scattered excavations in caves and near the old lake terraces indicate that it was several thousand years in the past.

Until A.D. 1500 bison ranged most of Utah and northern Nevada, but by the middle of the 19th century they had entirely retreated from the Great Basin area.

Indians Ate Grasshoppers

There were occasional seasons when Mormon crickets, or longhorn grasshoppers, appeared in large swarms. When this happened, the Indians collected enormous quantities for food by encircling an area with converging fire. The singed insects accumulated in piles in the center.

Lizards and snakes were staple articles of diet. The chuckwalla, a large lizard which lives only in the southern part of the Basin, was most eagerly sought (page 195). Strangely, the rattlesnake, one of the largest and more palatable snakes of the region, apparently was not used.

Indians fished along the Humboldt River and the streams near Great Salt Lake. In these areas fish could be caught in the winter, when other sources of food were cut off, by spearing or in weirs.

Most Great Basin tribes were skillful basket weavers. They collected wild seeds and roots in large conical carrying baskets and processed them in basketry trays (Plate XII). To carry water on long trips into arid sections, the Indians wove watertight baskets.

Living in widely scattered groups, the Great Basin tribes were so preoccupied with the food quest that they had little time for dances, which were held infrequently, usually when the food supply was temporarily abundant. For these occasions many families gathered at a rendezvous for a week or two. Participants [illegible] in a circle. Games of chance were a favorite pastime.

These gatherings were the normal time for courtships, and most marriages resulted from them.

Since the two sexes were not always equal in number, it was common for a man to have two or more wives; sometimes a woman would have more than one husband. The taking of sisters or brothers as plural spouses was considered a wise precaution against jealousy.

The Coming of the Horse

The horse, which had been introduced by the Spaniards into the Southwest in the 16th century, reached the Great Basin Indians early in the 19th century and profoundly affected their manner of living.

The Ute were a warlike people with considerably more tribal organization than their western Shoshonean neighbors. At one time the seven divisions of the tribe in Utah were organized under a single leader.

Horses increased their warlike activities and brought them more into contact with the Plains tribes from whom they learned to use clothing, tepees, and rawhide and leather containers (page 197).

The horse had already reached the Columbia before Lewis and Clark arrived there in 1805.

A Shoshoni Heroine

When the explorers reached the Hidatsa villages on the upper Missouri they hired Toussaint Charbonneau, a French-Canadian voyageur living among the Indians, to act as interpreter and guide.

Charbonneau's wife was the famous Shoshoni Sacagawea (Plate IV).

The Hidatsa had captured her when she was a young girl and had sold her to Charbonneau when she was about fourteen. Because of her knowledge of the Shoshoni country and her good character she was extremely useful to the expedition and won the high regard of its captains.

The first band of Shoshoni one encountered was in charge of Sacagawea's brother. Through her intercession the explorers obtained horses from the Indians.

Speaking of the fight during which Sacagawea was captured, Captain Lewis wrote in his journal: "Sah-cah-gar-we-ah our Indian woman was one of the female prisoners taken at that time tho I cannot discover that she

To His Secret Round House Goes a "Big Head" Dancer

[illegible] Plate XI [illegible] Tribe [illegible] Tribes [illegible] Society

[illegible] like their neighbors of the Great Basin. These dwellings were made [illegible] merely [illegible] wickiups [illegible] [illegible] in the lava [illegible] as [illegible]

The Nose-piercing Tribes

Traveling westward from the Shoshoni lands and [illegible] the Nez Perce tribes which occupied the valleys of the Snake River and the Columbia as far as the Dalles. French trappers [illegible] their [illegible] of preventing the piercing of the nose to receive a shell ornament.

West of the Nez Perce [illegible] other prominent tribes were the Walla Walla, the Palus, the [illegible] the Yakima [illegible] the Klickitat.

When Lewis and Clark visited the Nez Perce these Indians were living in communal lodges [illegible] [illegible] [illegible] [illegible] [illegible] and from two to four families.

Varieties of the conical lodge were used in the Northwest and extended west to California.

A large ceremonial [illegible] was usually built near each village.

The Nez Perce [illegible] in many Northwest tribes and private guardian spirit which could be obtained by [illegible] fasting.

They were courageous fighters and produced [illegible] the most admired American Indian leaders of their [illegible]

By the treaty of 1855 they ceded much of their tribal territory to the United States and were assigned to a reservation in the Wallowa Valley in Oregon and part of Idaho. With the sudden increase of white immigration they were still further restricted and ordered in 1863 to a much smaller reservation in Idaho.

Those living in Wallowa Valley refused to recognize the new treaty. Under the leadership of Joseph they won several de[illegible] United States troops.

When, [illegible] and underarmed [illegible] were obliged to give way. Joseph conducted a retreat with his entire band of men, women, and children that remains a masterpiece of [illegible].

With Col. Nelson A. Miles and his troops ahead of him, with Gen. O. O. Howard at his rear, and Col. S. D. Sturgis on his flank, [illegible] little party [illegible] than a thousand miles through Montana to [illegible] Canada, but [illegible] border. Here he was finally cut off by fresh troops and surrendered.

Prized Delicacy of Great Basin Indians Was a Fat Grasshopper

[illegible]

Joseph's speech at the time of his surrender expresses the hopelessness that came to tribes after battle as they retreated before the inexorable tide of white advance.

"I am tired of fighting," he said. "Our chiefs are killed. Looking Glass is dead. Ta-hul-hul-sote is dead. The old men are all dead. It is the young men who say yes or no. He who led the young men is dead. It is cold and we have no blankets. The little children are freezing to death.

"My people, some of them, have run away to the hills and have no blankets, no food. No one knows where they are—perhaps frozen to death. I want to have time to look for my children and see how many of them I can find. Maybe I shall find them among the dead.

"Hear me, my chiefs!

"I am tired. My heart is sick and sad. From where the sun now stands I will fight no more forever."

The Flatheads, a Salishan tribe, occupied most of western Montana. The name flathead was [illegible] not because they deformed their [illegible] unlike their neighbors to the west, they left their skulls as Nature formed them—flat on top.

They relied largely on fish for food but were active hunters as well. Their houses were underground dugouts with poles converging to form the roof. Cedar-bark mats were laid over these poles and covered with earth.

California's Complex Tribal Patterns

California comprises one of the most complex ethnological areas in the New World. Formerly it was supposed that as many as 22 different languages were spoken within the boundaries of the present State of California. But in more recent times linguists have grouped a number of these local languages into two chief stocks, Hokan and Penutian, and thus reduced the total number to 12 at most.

On the northwestern coast of the State two of the great linguistic stocks of America, the Athabascan and the Algonquian, are represented by a few small groups.

Just south of the Athabascan tribes are two small groups, the Yuki and the Wappo, who speak a language which so far as can be determined is related to no other in the world.

The physical structure of the Yuki also sets them apart from all other tribes. They are exceptionally short in stature and have unusually long heads.

Typical in northwestern California are semi-subterranean plank houses and dugout canoes with raised prows.

Money consisted of shells or strings of clam-shell beads. Big flaked obsidian knives symbolized large sums of money (Plate XIV).

The distribution of this type of culture corresponds more or less to the high redwood and fir forests of northern California, which are a continuation of the heavy forested area of the Northwest coast.*

If any tribes were typical, they were those in the central part of the State speaking Penutian dialects—the Maidu, the Wintun, the Miwok, the Yokut, and the Costanoan.

Farther south the Shoshonean linguistic stock of the Great Basin pours across the eastern border of the State. It includes such tribes as the Mono, the Chemehuevi, the Cahuilla (Plate XIII), and the Gabrieleño. The latter took up residence on the southern Santa Barbara islands.

Central California an Indian Promised Land

From the tribes of northern Mexico and the Pueblo tribes of the Southwest the extreme southern California tribes, the Mohave, the Yuma, the Kamia, and the Diegueño, learned to grow maize, beans, and squash and to make pottery of good quality. These were the only groups in California possessing real tribal solidarity.

Central California is the area lying between the foothills of the Sierras and the coast. The principal topographic features are the great Central Valley drained by the Sacramento and San Joaquin Rivers and the relatively low Coast Ranges which separate it from the ocean.†

The climate, as has been hinted by many chambers of commerce, is delightful.

Here were nearly perfect living conditions for primitive man. Deer and elk abounded; rabbits and squirrels were everywhere. Marshes and lakes teemed with waterfowl, the rivers were full of fish; and along the seacoast, in addition to fish, there were clams, mussels, abalones, crabs, and crayfish.

In the Plateau area to the north, if the salmon run failed, famine followed. In the agricultural Pueblo region to the south, if the rains did not come in time, starvation resulted. But famine was virtually unknown in central California.

Wild grass seeds and roots and bulbs were gathered in season. When the aborigine wished to vary his diet, there were also grasshoppers, angleworms, caterpillars, yellow-jacket larvae, and delicious beetle grubs.

Although the region is now one of the most productive in the world, the practice of agriculture was unknown to the Indians of this part of California. With such a variety of food sources the Indian here did not need to fear the failure of any one crop.

Acorns the Staff of Life

Numerous oaks produced each year large quantities of acorns, the staff of life of the California Indian. There also were pine nuts and buckeyes and the nut of the California laurel.

Acorns were gathered in the fall and carried to camp or village in baskets. They were then dried and stored in large baskets or granaries placed on platforms.

When ready for use they were hulled and ground to flour in the stone mortar, or in later times on a slab of rock.

Since the acorn in its natural state has a high tannic-acid content, making it extremely bitter, a leaching process was necessary before cooking. This was usually done by placing the meal in a basin of sand and pouring water over it. A faster way of accomplishing the

* See "California's Coastal Redwood Realm," by J. R. Hildebrand, National Geographic Magazine, February, 1919.

† See "More Water for California's Great Central Valley," by Frederick Simpich, National Geographic Magazine, November, 1945.

Lured to the Chin in His Elkskin Cradle, a Small Ute Brave Naps while Sister Poses Him

[illegible] 75 years ago while a [illegible] Major John W. [illegible] of the Southwest. His results were [illegible] burdensome equipment and difficult [illegible]

The Tepee-dwelling Cayuse of Washington and Oregon Bred Tough Little Ponies Which Took That Tribal Name

[illegible]

leaching was to bury the hulled nuts in the mud of a swamp for a year.

After the meal had been leached, it was mixed with water in a basket until it had the consistency of a fairly thick soup. Hot stones dropped into the container caused the mixture to boil. Thus cooked, it was ready to eat.

In central California the buckeye was pounded and leached in much the same fashion as the acorn.

Indian Fashions of California

In keeping with California's mild climate, the clothing of the Indians was simple. In aboriginal times men as a rule wore nothing. When the weather was cold they wore a skin wrapped around the hips.

Women in all parts of California wore double aprons. A small apron was suspended from the waist in front and a larger one behind.

Where deer were available, these were made of buckskin, usually with a fringe along the bottom. Shredded bark, grass, or fiber cordage had to suffice in localities where leather was lacking.

The usual footwear of the central tribes was a sock made of a single piece of dressed deerskin and sewed up the front and back. Moccasins were worn only on special occasions, such as war expeditions and long trips.

The tribes of southern California wore sandals, often made of twisted ropes of agave fiber.

As basket weavers, the California tribes are without peers in all the world.

In the north, weaving or twining techniques are used; in the south, coiling is the predominant form.

Basket weaving reached its peak among the Pomo, who practiced a wide variety of weaving techniques and produced the beautiful feathered baskets generally considered the finest examples of the basket-weaving art (Plate X).

Despite this weaving skill, nothing resembling cloth was produced in California. The twisting of rabbit-skin strips or feathered strips of bird skin into robes and the twining of tule mats are the nearest approach to it.

Medicine Men and Specialists

Many California tribes had chiefs whose position was hereditary. The individuals with the most power were the medicine men who could make their fellows believe they could cure or inflict disease. Many were supposed to gain the aid of spirits; others were specialists.

For example, there were medicine men whose only function was to cure or prevent snake bites. Some snake doctors performed a ceremony in which live rattlesnakes were handled.

The bear doctor claimed the power of killing enemies by turning himself into a grizzly bear. Such practitioners were greatly feared.

In the northern part of California the medicine man diagnosed illness, which he cured by sucking out of the patient the object which had caused the disease by invading the body. Such objects might be a piece of flint, a live lizard, or a spider.

By collecting poison from reptiles, insects, and plants and mixing it with some part of the intended victim, such as a hair or a nail paring, the poison doctor, it was believed, could cause death.

This idea of parts of the body being connected with controls by other persons was widespread in California. An old Indian woman of my acquaintance had a bag filled with [illegible] which she had saved all her life, fearing lest they fall into the hands of an unscrupulous person who might harm her.

The medicine man claimed his power from a vision, produced by fasting or drugs, in which he met and conversed with some animal who instructed him in the method of keeping in touch with the spirit world.

Most Indian dances and ceremonies were rituals of religious cults. In central California costuming for these rituals was elaborate, involving the lavish use of feathers and flowers (Plate XI).

War and Victory Dances

Throughout California special and elaborate public ceremonies were held for girls when they reached adolescence. There also were war and victory dances.

In 1542 Juan Rodriguez Cabrillo sailed among the channel islands and along the Santa Barbara coast, where he encountered the Chumash Indians.

These interesting natives were in many respects the most advanced in California, and among the most unusual. The Spaniards considered them superior to others in the region.

They occupied the mainland and the three northern islands of the Santa Barbara Channel. On one of these islands, San Miguel, Cabrillo died.

Their canoes were remarkable creations made of planks, fitted and lashed together and calked with asphalt. They were up to 25 feet in length and were capable of ocean navigation. Both double- and single-blade paddles were used (Plate V).

The Chumash territory, with its ideal climate and abundant food, was the most densely populated section of California. The villages consisted of large dome-shaped communal houses up to 50 feet in diameter, accommodating 40 or 50 persons.

They were built by placing the butts of a series of willow poles in a circle and bending them so that the tips were tied together at the top. Crosspieces were attached in the manner of a frame, and the whole structure was then covered with tule mats.

Chumash Housing Features

The houses were partitioned into rooms, and platform beds covered with tule mats were used. These two modern features were unique among California tribes.

The Chumash were fine basket weavers and skillful wood carvers. In addition they made beautifully formed and polished globular pots of soapstone, often very large, as well as excellent stone carvings of animals, birds, and fish.

The earliest description of the Indians of the more northern section of California is that written by Francis Fletcher, chaplain of Sir Francis Drake's ship which landed on the coast north of San Francisco in 1579. These Indians were undoubtedly the coast Miwok.

The natives received the Englishmen with elaborate ceremonies and loud wailings. The women tore out their hair and lacerated their bodies until they were covered with blood.

Drake was crowned with an elaborate feather crown, and around his neck were placed yards of shell beads. The puzzled Englishmen did not realize that the Indians considered them to be their departed ancestors returned from the land of the dead.

Visits of explorers and buccaneers to the California coast for more than two centuries after the time of Drake were so infrequent that the life of the Indians was unaffected.

The first Franciscan mission in California was founded at San Diego in 1769.

Following this, twenty other missions were established along the coast by 1823, finally extending north of San Francisco Bay (Plate XVI). The Indians were not warlike and were easily brought under the influence of the missions.

They were compelled to work at strange tasks. Discipline, to which they were unaccustomed, was rigid; refusal to work or attend church was punished. The natives were clothed, and their health and spirits began to fail. There were many attempts to escape, but there were always troops to round up the recalcitrants.

In 1834 the Mexican Government began taking over the missions, making token provision for the Indians.

By this time the Indians had lost the self-assurance that went with their own culture, but had not learned to adapt themselves to the new. They soon lost their restored belongings, their numbers began to decrease rapidly, and the mission tribes were on their way to extinction.

The gold rush in 1849 concentrated in the north and along the Sierras where the missions had not penetrated.

Gold Seekers Clashed with Indians

There was some resistance from the more warlike northern tribes such as the Modoc and the Shasta, but the opposition was shortlived (Plate IX). The lot of these tribes in the early days of the gold rush was hard. In some instances miners hunted them like wild game for sport.

Following the mining period came the amazing agricultural development of the State. As the white population increased, the Indians steadily decreased. Many tribes are now extinct; of others only a handful of survivors remains.

A few tribes in the northern part of the State and a few in the interior section of the south are still extant.

To the white man California may be a paradise gained, but to the Indian it is a paradise lost.

[illegible] to include your new postal zone number.

Rubber-cushioned Liberia

By Henry S. Villard*

OUT of the morning mist the African coast rose in low outline, disclosing the rocky promontory of Cape Mesurado. As we drifted nearer, the city of Monrovia took on form, giving the unmistakable impression of architecture transplanted from our Southern States.

At 8 o'clock our United States war vessel was thundering a 21 gun salute to the Negro republic of Liberia, the only fully independent Negro state on the African Continent, where only persons of African descent are eligible for citizenship †

Our greeting was duly echoed with white-puffed accompaniment by the battery at Fort Norris. A courtesy call by the U.S.S. *Boise* was officially under way.

Our cruiser rolled at anchor in the coastal swells while port officials clambered aboard from a longboat rowed by stalwart Kru oarsmen in striped jerseys. At the stern floated the flag of Liberia, patterned on the Stars and Stripes; six red and five white stripes, with a white star against a blue background in the upper left-hand corner (Plate I).

Riding the Breakers into Monrovia

We left the ship's side in a naval launch to negotiate the breakers over the sand bar which blocks the approach to Monrovia and the Mesurado River. An exciting experience always, this landing on the African coast.

With an expert Kru pilot perched in our bow, we took the running waves at exactly the right moment. A breathless second when we seemed to drop to the ocean floor, a dash of salty spray in our faces, and we were riding serenely in the protected lagoon behind the sand bar to a welcome at the customhouse.

Future travelers to Liberia will not experience this thrill of landing through the dangerous surf. Monrovia now has a modern, man-made harbor, just completed by American contractors under a tripartite agreement with the United States Government and under the supervision of the United States Navy. The harbor is large enough to accommodate lighters and small naval craft.

Begun during the war, Monrovia's new port cost $19,000,000 in Lend-Lease funds. Liberia expects its wharf and warehouse facilities to be of tremendous value in helping to open up undeveloped but potentially rich hinterland.

Wedged between the British colony of Sierra Leone and the French Ivory Coast, a few degrees north of the Equator, Liberia occupied one of the most strategic areas on the globe during World War II (map, p. 204).

The country was not far from the British naval bases at Freetown, Sierra Leone, and Bathurst, Gambia, and athwart the route of American bombing planes which were ferried to the British forces in the Middle East.

In recognition of the ideals for which the United States fought, the Liberian Legislature, on January 27, 1944, declared war upon Germany and Japan.

War Brought Modern Airports

A modern airport was constructed above Marshall, on the bank of the Farmington River near Harbel, for the use of landplanes coming from America and as a link in the coastal airdromes of West Africa. It was named J. J. Roberts Field in honor of the first President of Liberia.

Just behind Cape Mount, on a vast natural expanse of water called Fishermans Lake, Pan American Airways established a transatlantic terminal for its Clipper seaplane service from the United States to Léopoldville, in the Belgian Congo.

When Japan attacked Pearl Harbor, all bomber and passenger traffic to the Far East was routed by way of Africa, and Liberian territory became a principal African landfall for these flights.

After the war, the U. S. A[illegible] out of Liberia. Roberts Field [illegible] $3,500,000, no longer was a scene of feverish activity. More recently it ceased to be a [illegible] complete closure.

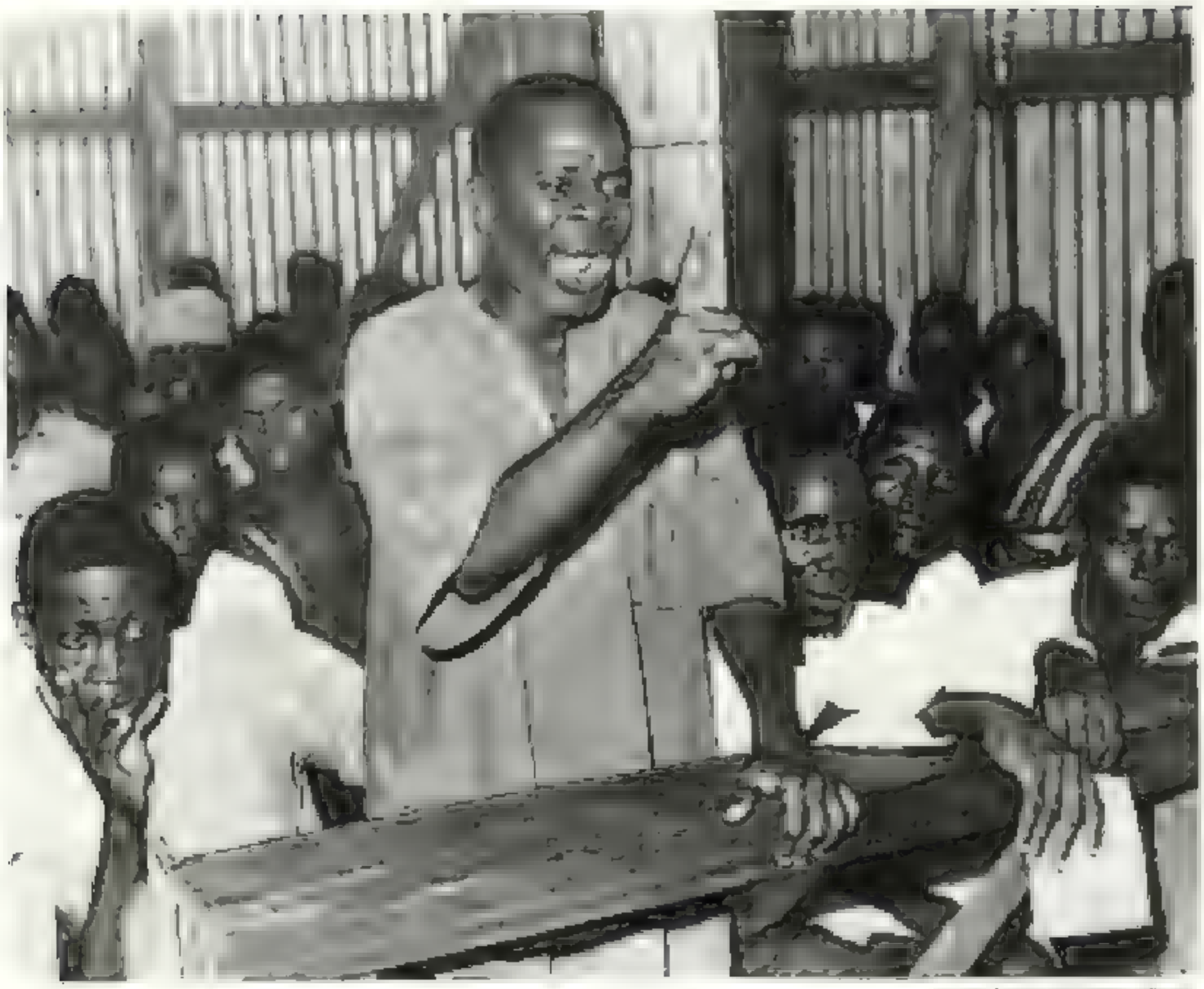
Liberally sprinkled with palm trees and bright flowers, tall pillars and wide verandas, the city of Monrovia with its 10,000 inhabitants suggested to our first glance a miniature Charleston or Savannah (page 206).

Along Water Street, teeming with small shops and markets, crowded with brightly dressed native women and European-clad citizens (Plates V, VI, VII, and page 205), we drove to the American Legation.

The streets were unpaved but neat. Houses in the residential quarter, closely akin in style

* The author, a Foreign Service Officer of the United States, is a former Deputy Director Office of Near Eastern and African Affairs, United States Department of State.

† See "Land of Law Free in Africa," by Harry A. McBride, NATIONAL GEOGRAPHIC MAGAZINE, October, 1947.



"If It Please Your Honor"—a Liberian Pleader in Magistrate's Court

[illegible] Wood War

[illegible] to those in the [illegible] States, [illegible] well-planned city [illegible] the rumbling native waterfronts [illegible] of Kru town.

[illegible] several points of interest we took an preliminary tour [illegible] the city: the attractive Executive Mansion [illegible] Department of State, Government Square and the Hall of Representatives, all [illegible] on the higher ground in the center of town.

[illegible] the [illegible] of our vessel set out on [illegible] to the [illegible] tonical sunset, official [illegible] everyone [illegible]

[illegible] the [illegible] the [illegible] for road from Monrovia to the [illegible]

[illegible] was determined to have a bird's-eye [illegible] of the land we had [illegible] Navy [illegible] swelling seas with a [illegible] a moment [illegible] was unfolding beneath a [illegible] gathering rain clouds.

Breakers Block Stream Mouths

The white strip of low-lying [illegible] is relieved by three bold [illegible] Mount, 1,000 feet high; Cape Mesurado [illegible] and Cape Palmas [illegible]

It was [illegible] of several rivers whose outlet to the sea was [illegible] by hazardous shoals and the [illegible] we had found at Monrovia [illegible] breakers and swirling currents [illegible]

[illegible] considered densely wooded. It rolled away in a gradual [illegible] over an elevation of [illegible] through to the far interior, which [illegible]

A Shot of Serum, and Mr. Parker Is Immune to Hog Cholera

[illegible]

[illegible]

Along Cooper's Aviation Highway

[illegible]

[illegible]

Liberia, Africa's Only Independent Negro State, Is Smaller than Pennsylvania

A century ago the Negro republic declared its independence, following establishment of a settlement there 25 years earlier by Free American slaves. Now the Maryland County, Washington, Monrovia, and [illegible] Liberia, lying between Sierra Leone and [illegible] French West Africa.

one day be extended over the rest of the trail. At intervals we encountered tracks, jammed with native bearers or supplies.

Life in a Tribal Village

Once we wandered into one of the little communities encountered at such short distances in this land of two million inhabitants. [illegible] traditions and tribal authority, which grew ever more primitive the farther one journeys into the interior, were plainly enough the basis of this society, where the family group is usually polygamous.

A grizzled dark-skinned local chieftain, clad in loincloth and what might have passed for a soldier's hat, grinned and posed obligingly for his photograph.

In the door of one of the more substantial dried-mud huts, a shoeless young man, comparatively well clothed in shirt and trousers, was industriously weaving cotton cloth on a primitive hand loom.

A comely woman, bare from the waist up, carried a huge basketload on her head, an infant slung at her back, and, obviously, another one on the way.

Flies and chickens swarmed in the background. Patches of cassava and yams were

He Can Repair a Torn Garment While You Wait

[illegible] tailors ply [illegible] in [illegible] Monrovia. [illegible] [illegible] the Mission [illegible] [illegible] [illegible] [illegible] the street.

under Liberian supervision on the outskirts of the settlement.

We [illegible] of the country [illegible] we were convinced that the entrance of the Firestone interests on the Liberian scene has contributed enormously to the stabilization and economy of the country.

Following [illegible] American [illegible] by Government restrictions, the late Harvey S. Firestone turned to Liberia as most [illegible] with [illegible] rubber [illegible].

In 1926 the Firestone interests literally [illegible] the credit of an [illegible] American rubber supply by contracting the lease of a million acres of land; at the same time, according to agreement, a loan to the Liberian Government of $5,000,000 and the appointment of an American Financial Adviser to supervise the collection of the Government's revenue as well as its expenditures.

Today, about [illegible] natives [illegible] employed on the plantations, [illegible] Firestone has been [illegible]. Present employment was about [illegible]. At the height of [illegible] planting the figure rose to [illegible].

Monrovia Honors Liberia's Retiring President Barclay and Incoming President Tubman in an Inaugural Day Parade

Harper, Liberia's Southernmost Port, Stretches into the Sea on Cape Palmas, on Arm of Solid Rock

A [illegible] which [illegible] Firestone River [illegible] Note the [illegible] Most of Harper [illegible]

We were escorted on a whirlwind survey of the area by the American resident manager who is in charge of the dual task of rubber growing and conducting the company's business relations with the Government.

On cleared ground we inspected the two types of dwellings provided for the laborers—small brick houses with tin roofs and the familiar native thatched hut (Plates XII-XIII and page 228). At last accounts the former numbered 8,017, the latter 905, while the overseer-type houses totaled 128.

For the white staff with their wives and children, numbering about 250, there were up-to-date bungalows furnished with many of the conveniences of home.

Modern Hospital for Workers

Modern medical facilities and sanitation have been provided for both tribesman and foreigner.

The story of rubber has been told too often to bear repetition here, but the sight of trees being tapped for the slow-dripping milky fluid makes the trip of constant interest to visitors (Plates X, XI, XV).*

With some 75,000 acres already planted, of which 62,514 acres were actually in production as of January 1, 1947, and with shipments approaching fifty million pounds annually, the Firestone undertaking is the biggest factor in the economy of Liberia.

Throughout Liberia, Firestone has built 200 miles of first-class earth roads.

Firestone also operates the Bank of Monrovia, sole institution of its kind in Liberia, and has organized the United States Trading Company, which does a lively commissary business not only among the white employees of the company but also among the thousands of Liberians residing on the plantations. Firestone, moreover, built Roberts Field for Pan American Airways.

Returning to Monrovia, we were forcibly reminded of the unique political structure of Liberia. Of the 28 tribes who live quietly today within its borders, from the scholarly Vais and the Mandingos of Arabic heritage to the stalwart Krus who take naturally to the sea as boatmen and deckhands on the ships that touch at the various ports of West Africa, relatively little has been published.

Tribes Cling to Old Beliefs

Basically pagan, with the exception of a scattered Mohammedan following, the Irish tribes range through various shades of color, speak a variety of dialects, and adhere to beliefs they have practiced for centuries.

Their principal occupation is the cultivation of rice, corn, cotton, and such essential food products as grow most readily in the tropical climate. Some domestic animals are raised, including goats, sheep, and cattle. Pottery and basket making, weaving of cloth, and working in leather, iron, silver, and gold are the ordinary industries.

As an example of the latter, we purchased from an apprentice goldsmith in one of the wayside villages a finely wrought, though somewhat malleable, pair of cuff links made of gold taken from some near-by alluvial deposit.

Against such an elementary social background, a way of life carried over from American pre-Civil War days had been successfully superimposed by descendants of Negro colonists from the U. S. and West Indies.

Together with some 60,000 of the aborigines whom they have assimilated, the 12,000 survivors of this original American immigrant stock make up the civilized society of the coastal region and carry on the business of the country in government, in trading, and in law.

Freed Slaves Settled in Liberia

The birth of Liberia as a nation was a natural consequence of our Government's decision in the early years of the nineteenth century to prohibit the further importation of slaves. Contraband human cargoes were being seized by naval patrol vessels, and the idea developed of returning the liberated Negroes to the land of their origin.

Most of the early Negro emigrants from America who sought a new life on the shores of what is now the Republic of Liberia were freedmen sponsored by societies formed for their colonization.

Chartered vessels, after the Emancipation Proclamation, transported a large number of Negro agriculturists and small traders to the distant homeland across the waters.

The habits, customs, language, and religion of the Americo-Liberians, are, of course, utterly dissimilar from those of the aboriginal inhabitants who never left their own land.

English was their language in America, and English is the official language of Liberia.

European dress is the fashion in the coast towns they founded. English silver was the prewar medium of exchange, but today it is the American dollar.

Affiliation with some branch of the English or American churches is almost universal among the people. To a considerable extent, education is assisted by American or English foreign missionary organizations.

* See "Our Most Versatile Vegetable Product," by J. R. Hildebrand, NATIONAL GEOGRAPHIC MAGAZINE, February, 1940.

Pennsylvania Guard Escorts Liberty's Bell, Pittsburgh, 1861 (Bell Ringer)

[illegible]

An Animated Haystack with Horns. Head Dances to the Thrill of Drums. It Dances Away Until Spent.

Lower Strings of Beads Provide Lovely Strings of Wives to Lay Medicine

[illegible]

Strings of Beads provide Lower Sense the Skin Problem

[illegible]

Tribal Marks on Foreheads Are in the Height of Fashion

Gaily Dressed Young Mombasa Couple and Their Elaborate Spouse

A Group of Girls Graduate Classes by Bus to Moscow to See the Sights

Selling Food in Monsour's Market Is Women's Work

In a Western Mexican Village a Woman Pounds the Family Rice

In Mussulman's Market — Mahommedan Trader Displays a Native-woven Cotton Blanket, Colored with Natural Dyes

Hundreds of Small Beads Are Strung [illegible] Massive Woman's Necklace

[illegible]

Too Poor to Sell the Ivory Tusk to a European Visitor for $20

[illegible]

Looking for Jobs, They Start a 150-mile Bush Trek to the Mulungu Plantation

"Chop" Tea on a Rubber Plantation in Northern Africa of Beans, Rice and Fish and Coffee Mongoids

[illegible]

A Hopper Brings In Milk-white Latex to the Bookeeper

Skillfully the Bookeeper Taps a Rubber Tree to Increase Yield

Figure 3. Rubble, Gardners Point, Valleys of Tuscaloosa Flow

Lumber from 250,000 Acres of Trees Helps Meet America's Demand

Hurry, Harry! Gibraltar's General Store Has Just Opened a Sale of Newly Arrived Colored Cabs

Liberia Exports Carried Its Rubber as Liquid Latex

Raw Latex Rubber Goes to the Drying Sheds

Tribesmen Set Up a Lean-to near a Small Waterfall Which Has Had a Scrubby Log

It would be difficult to tell much difference in appearance today between the towns of Monrovia, Marshall, Harper, or Robertsport, and similar settlements in our Deep South.

Such affairs as the weird tribal dances, which were put on for the benefit of the visitors from our ship, they regarded exactly as any other body from the civilized world would regard native practices of this kind.

Modern Appliances Reach the Bush

In turn, the America-Liberians have introduced the radio, the automobile, the movie, the electric light, and the refrigerator into the bush country.

Outstanding example of the civilization transplanted by the America-Liberians is former President Edwin J. Barclay.

In the first five minutes of a private interview Mr. Barclay revealed a grasp of international affairs that would gain respect in any chancellery of the world. His keen eyes showed that he was well aware of present-day political trends and developments; of how they may affect the future of his country.

He was educated in his Government's own Liberia College at Monrovia and knew the country intimately through frequent tours into [illegible] where he [illegible] the cooperation of tribal leaders in keeping peace.

His successor, President W. V. S. Tubman, not only has continued the progressive tendencies of Mr. Barclay but has gone even further. His sincere interest in the remote tribes has carried him deep into the interior of the country, which has meant covering many miles over rough trails, either by hammock or on foot.

In May, 1943, President Barclay, soon to retire from office, and President-elect Tubman visited the United States. They were entertained by President Franklin D. Roosevelt at the White House, and Mr. Barclay made brief addresses to the Senate and House.

They came to Washington to repay the visit made to Liberia by President Roosevelt following the historic Casablanca conference.

United States Sponsored Birth of a Nation

To understand fully what prompted the visit of our American cruiser, we must go back to the historic concern of the United States Government for the destiny of a nation which was carved out of the African wilderness by settlers from our own shores.

In Washington, D. C., 130 years ago, the American Colonization Society was formed. Its supporters included Judge Bushrod Washington, nephew of George Washington, Henry Clay, Daniel Webster, Senator John Randolph of Virginia, Francis Scott Key, and President James Monroe, for whom Monrovia was named.

With an appropriation from the United States Congress, two small schooners were fitted out to carry Negro colonists to West Africa. By 1822, under white leadership, the first permanent settlers reached the mouth of the Mesurado River.

The tribulations of the Pilgrim Fathers were paralleled in this equatorial setting. A sullen welcome awaited from the native chiefs, who saw their lucrative slave trade jeopardized. But with the help of Capt. Robert F. Stockton, who had sailed to the Mesurado under United States Government orders, a bargain was finally clinched for a suitable strip of land.

The story goes that a deed was obtained in return for a colorful and miscellaneous collection, embracing nails, iron bars, mirrors, hats, shoes, beads, umbrellas, walking sticks, knives, forks, spoons, rum, and a box of soap.

After Stockton sailed away the colonists cautiously moved to the mainland and, in the face of all cruel discouragements, began to build their homes and till the soil. The torrential rains were a terrible handicap. Fevers, illness, and death came with appalling frequency.

Liberia Becomes a Republic

"The Love of Liberty Brought Us Here," later to become the national motto, was steadily repeated by the staunch band of pioneers as they dug in to stay.

Colonization societies in New York, Pennsylvania, and Massachusetts backed other settlements along the inhospitable shore line, which presently united for mutual protection in the Commonwealth of Liberia.

Official agents of the United States Government assisted in maintaining the enterprise in its early struggles, and arms and ammunition were supplied through them for defense.

Twenty-five years after its founding, the Commonwealth had a population of 4,000 America-Liberians. By that time Liberia was experiencing the growing pains of statehood.

On the ground that it was not a sovereign nation and therefore had no right to enforce customs laws, the captains of trading vessels defiantly landed goods at various points on the coast and refused to pay either tariff or fines. Upon the advice of the American Colonization Society, the settlers resolved to put an end to their equivocal status and become a full-fledged independent nation.

On July 26, 1847, Liberia's Declaration of Independence was announced to the world

Basic Dwell Engineers Want To How Thus Bear This Pressure

[illegible]

U. S. Navy photo

Sailors of U. S. S. *Potomac* Man the Rail to Receive Liberia's President

President William V. S. Tubman (in white) is piped aboard the cruiser at Monrovia's new Lend-Lease harbor in July, 1947, to help celebrate the Republic's 100th anniversary. The harbor, completed a few months later, is big enough to accommodate the *Potomac*, but much work remained before it could be completed in scheduled time. Great Britain and France sent cruisers for the ceremonies, and detachments from these warships took part in the centennial parade.

A wary postwar American Senate, however, refused to approve a loan, and the Liberian Government was left in desperate financial straits, from which it succeeded in extricating itself by negotiating in 1926 a loan of $5,000,000 from the Firestone rubber interests.

Rubber Benefits a Bankrupt Nation

The results to Liberia of this plan were instantaneous and far-reaching. With the funds available, the Government was able to lift itself out of the financial morass into which it had wandered and to consolidate and fund all its external and internal debts.

While gold production has substantially increased and [illegible] sources has been begun by an American company, the economy of Liberia was nevertheless greatly affected by World War II.

Except for [illegible] Liberia was a German [illegible] of its trade goods and [illegible] type of fibers, palm oil, palm kernels, coffee and cacao, and German interests played a leading part in the import trade and in shipping. Now, of course, the Germans don't call there any more.

More than ever, Liberia looks toward the United States. American ships are her principal link with the world. Of the exports of Liberia [illegible] sent to the United States accounted for [illegible] all but [illegible] of which was of American origin and represented in large measure Firestone machinery and equipment. British West African silver was retired from circulation on December [illegible] and [illegible] United States currency.

In the wartime [illegible] Liberia suffered a [illegible] decline [illegible] Lend-Lease [illegible] Liberian

Deep in a Cultivated Rubber Forest Nestles a Firestone Model Village

[illegible] (see Plates XII, XIII) [illegible]

of his time to [illegible] Frontier Force [illegible] can be [illegible] at the [illegible] and [illegible] the [illegible] over [illegible] expenditures.

New sources of increased revenue [illegible] through better collection of the hut tax and additional [illegible] of gold and rubber [illegible] receipts were reported at about a million and a half dollars [illegible]. The [illegible] has been [illegible].

[illegible] present [illegible] to [illegible].

[illegible] during the [illegible] period [illegible] Maryland County [illegible] towns of [illegible] Buchanan, Washington, Robertsport, and Greenville. Treaties of friendship, commerce, and navigation, and of conciliation and arbitration have been signed between the two countries.

The [illegible] of the American Legation at Monrovia, led by Minister [illegible], is entirely composed of members of the Negro race.

As our vessel [illegible] from the port [illegible] which [illegible] successfully [illegible] its independence throughout [illegible] years, we felt that the United States more than ever could not forget its special responsibility for the welfare of [illegible] of Liberia.

First American Ascent of Mount St. Elias

By Maynard M. Miller

EVERYTHING was set. On the icy shoulder of the mountain we had stamped out the drop square, 50 yards on a side, in deep new snow.

The U. S. Army Air Forces support plane swept into view on its first drop run. Breathing the thin, bitter air at 13,300 feet, we watched for precious food supplies to burst down, rations sorely needed to feed our tired bodies the rest of the way to the top.

Everything was going well. Above us swirling mists had revealed, and hid again the icy crown of Mount St. Elias, fourth highest peak in North America.* A mighty marker post on the Yukon-Alaska boundary, where Alaska's panhandle meets the "pan," the gleaming bulk of rock and ice soars 18,008 feet above the Pacific Ocean (map, page 231).

It was July 13, 1946. We had waded ashore at Icy Bay nearly a month before.

"I Felt Myself Drop"

Then it happened. Unroped, with camera in hand, I stepped back a few feet from one of the test pits we had dug out of the snow. I wanted to get both camp and approaching aircraft into my picture.

Without warning, I felt myself drop. Instinctively I spread my arms. By sheer luck they held on the edges of the hole, abruptly arresting my fall.

I don't think I breathed again until a couple of the boys ran over and hauled me out.

Peering into the pit that had almost swallowed me, I couldn't see bottom. It apparently was part of a buried crevasse behind the cornice overhanging the 6,000-foot cliff in front of our Camp Ten.

Then, after I had shaken the snow from my clothes and the fright from my heart, I looked on in dismay as the silver plane plunged through patchy fog on its last run. Two big boxes of priceless food tumbled from the aircraft's belly and fell, not on the target area, but over the ice cliff, smashing to bits long before they ever hit the glacier far below.

The pilot had overshot, but it was no fault of his. The weather was rapidly "going sour" and he had to let go through the thickening "soup" or not at all.

That was the way it went. The "Saint," as we familiarly dubbed the great mountain, was ever alert to catch us off balance, as it had just caught me! Across our path it threw yawning crevasses, rumbling avalanches, and treacherous ice slicks. All these hazards we met with caution and strict safety technique.

There were eight of us, seven men and one woman, all experienced mountaineers. Through the war we had hoped, our spirit with remembrance of our compact to join forces, after the "unpleasantness," to attack this great peak.

The fruition of long planning and hard labors was now, it seemed, within our grasp. The Harvard Mountaineering Club Mount St. Elias Expedition was close to its goal.

No American had yet stood on the summit of St. Elias. Sole previous conqueror of the peak was the illustrious Italian Alpinist, the Duke of the Abruzzi, who led an expedition to the summit in 1897, by way of the northeast ridge. Our approach was by the southwest ridge, a longer and more difficult route.

Our climbing ropes held mountaineers from four corners of the United States: Andrew Kaufman of Washington, D. C., and his wife, Betty, who constituted the food committee; William Latady and William Putnam, from Cambridge and Springfield, Massachusetts, in charge of equipment and camps.

Then there were the Mulchaey brothers, Dee and Cornelius ("Kay"), Los Angeles men, respectively our photographer and meteorologist; Lt. Benjamin Ferris, from the Climatic Research Laboratory, Lawrence, Massachusetts, loaned to us as Army observer and medical officer; and myself, from Seattle, Washington, as leader.

Keyed up with anticipation, our little party had flown from Juneau to Yakutat on the afternoon of June 17.

Air Forces Give Support

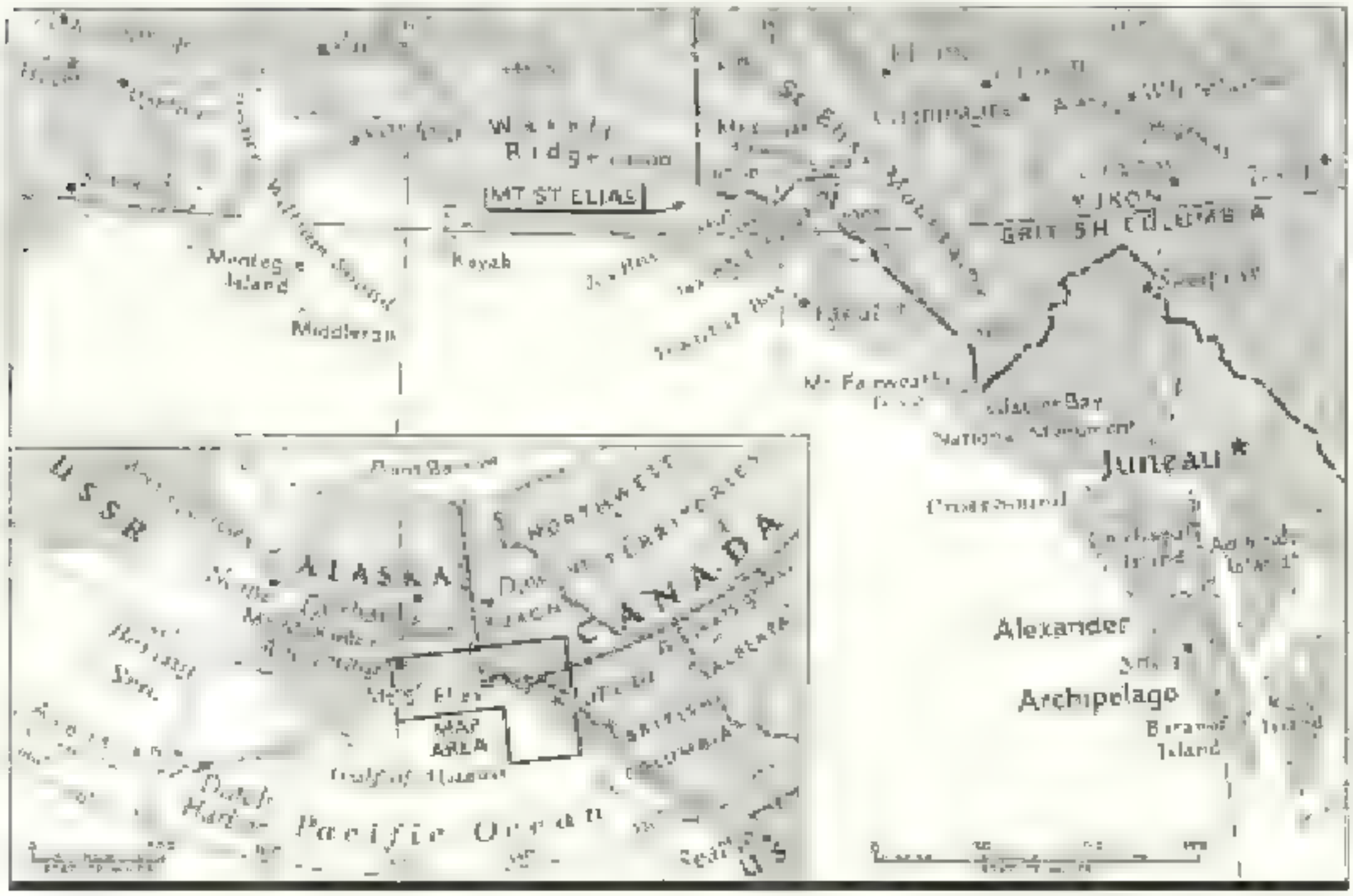
Through the interest of Gen. Carl Spaatz, Commanding General of the Army Air Forces, Chief Air Force (Chief of Staff), and Brig. Gen. Edmund C. Lynch, head of the Alaskan Air Command, the AAF's Tenth Rescue Squadron had been assigned to give us air support as a practical training exercise.

Ours was the first civilian mountaineering expedition to enjoy full-scale military aerial support throughout its progress.

* See "Mount St. Elias, Alaska, First National Geographic Society Expedition, 1890," and "Mount St. Elias, Alaska, Second Expedition, 1891," in the *Cumulative Index to the National Geographic Magazine*, 1899-1949; also "Glaciers of Alaska," by R. H. Sargent, July, 1929, and "National Geographic Society's Alaskan Expedition of 1926," by Ralph S. Tarr and Lawrence Martin, January, 1910.

The Trail Winds among Deathtrap Crevasses. Some (Right) Are Bridged by New Snow

[illegible] Mount [illegible] [illegible] Mount [illegible]



Produced by Thomas Rose and Irene E. Morgan

Mount St. Elias Rears Its Icy Crown Where Alaska's Panhandle Meets the "Bun"

Vitus Bering, Danish navigator exploring for Russia, sighted Mount St. Elias from far at sea July 16, 1741. He was the first European to view North America's fourth highest peak, brought to 18,008 feet by the Expedition. Mount St. Elias is the highest point in Canada and the highest in Alaska. The anniversary of Bering's discovery. Main map and inset show the first, second, and 10th of North America's greatest mountains: Mount McKinley (see inset), Mount Logan in Yukon Territory close to St. Elias, and Mount St. Elias. Third ranking summit is Mexico's 18,855-foot Citlaltepec.

Capt. Roy Holdsworth of the Tenth Rescue Squadron flew his plane from Anchorage to Yakutat one afternoon. In a preview flight over our mountain objective, we arranged sites and signals for the aerial delivery at three points of a ton and a half of equipment and supplies (page 245).

Fragile items, such as radios, cans of gasoline, skis, and instruments, were to be parachuted. Food and unbreakables were sturdily packed for free-dropping (page 248).

A local boatman, Tony Novatney, agreed to take us into Icy Bay, our jump-off point for the trek to St. Elias.

With 3,000 pounds of back burden, we went ashore in a cold drizzle and waved a doleful farewell to the little craft puff-putting back to civilization. We were on our own.

Army Equipment Put to Test

The Army Quartermaster Corps and the Army Air Forces had supplied us with a lavish assortment of clothing and equipment which we agreed to test. Much of the material had been designed to take advantage of lessons learned during the war, but had not yet been thoroughly tried out in the field.

In addition to a variety of alpine climbing, camping, and traveling gear, we modeled 7 11 kinds of cold-weather clothing (Plate VIII).

More than three-fourths of our route would be over ice and snow, so we would have a golden chance to study effectiveness of equipment made for Arctic and alpine use.

It proved a time-consuming exploit to move 2,000 pounds of equipment up to the final base line under Mount St. Elias, after establishing caches for our return. Several trips were necessary between each camp to relay the stuff along. Five rough miles brought us to the Chaix Hills. From there we looked up over broken ice of the Tyndall Glacier to 11,921 foot Mount Haydon, an unclimbed summit whose slopes formed part of our route to the Saint.

Tyndall Glacier interposed a heartbreaking barrier. The direct traverse we had planned proved impossible, for the river of ice was meshed with crevasses. To circumvent these we had to take a zigzag course, traveling several miles laterally for each mile of forward progress.

To save time we cut corners, crossing narrowing crevasses by precarious snow bridges.

The glacier startled us frequently with jerky movements. Jumbled icefalls were too dangerous to set foot on; we skirted these awesome obstacles. Laden with heavy packs often weighing 80 to 100 pounds (Betty carried lighter loads, up to 55 pounds), we were working very hard even though moving at a crawl's pace.

Everybody donned dark glasses as soon as we hit the ice. When the sun shone, the thermometer in wind-free snow basins reached 85°, largely because of glaring reflection.

Desert Heat on Tyndall Glacier

An untaped nose quickly became scorched and red. If we impatiently shed shirts, severe burning was the penalty. There was a good excuse to let beards grow; if we had shaved, sunlight reflected from snow would soon have seared the undersides of our chins.

As I ran back and forth on the glacier above Camp Six taking movies of the relay party, my mouth hung open from exertion. That evening the roof of my mouth was sunburned. My tongue and lips were so sore I could hardly eat. I kept going by sipping cold tea.

Camp Seven, at the base of the main bulk of the Haydon-St. Elias massif, was a perfect spot for a "seventh-inning stretch" before tackling the upper slopes. A lovely sun-soaked meadow of heather, moss, and grasses fringed the foot of a ridge up which our route would pass.

Our name for this camp, "Shangri-la," was descriptive, if not original. Strains of a harmonica, swelling and ebbing across the lonely land, alerted Nature in calling us to relax in an attitude of "Who cares!" Ben Ferris stretched out on the warm grass, expressed the general sentiment, "Let's stay here for the summer. To heck with going any higher!"

Ben aroused himself sufficiently, however, to keep up the "step test" and other physiological experiments and observations which we had promised to carry out for the Harvard Fatigue Laboratory. Although the physical condition of our party improved all the way up St. Elias, at our highest camp none of us could complete the step test, because of the oxygen lack three miles above sea level.

This test required each man to step up on a 20-inch box once every two seconds for five minutes, to permit a check on pulse and respiration changes at different altitudes.

On a snow slope near Camp Seven the Tenth Rescue Squadron made the first drop of supplies on June 27, exactly on schedule. It was a joy to see the big DC-3 swoop in at 200 feet and dump more than half a ton of goods squarely within the target area.

But the plane's visit reminded us that we still had 15,000 feet of mountain to scale and that our next rendezvous with Captain Hendelman and his crew was only a few days off.

While some of us completed relaying supplies from Camp Six to Camp Seven, we sent out an advance crew to dig in the next two camps and prepare for the aircraft's return.

Advance Party Scouts Route

Putnam, Latady, and I each took 60 pounds and started up on June 29. Rotten rock slowed our pace on the first ridge, but by sundown we had reached a shelf of shale at 7,500 feet, ideal for a campsite.

Next morning dawned crystal clear. Looking ahead up the chosen route, we saw the glaciated rim of a huge cirque, or ice-floored mountain amphitheater, curving away for miles towards the summit of Mount Haydon. Below the rim lay a great snowy basin.

From Camp Seven the others began to bring up the first relay loads. Latady, Putnam, and I set out to pioneer farther along the avalanche-swept cliffs that walled the cirque (page 245).

Crossing a steep narrow gulley, we became aware of a terrifying sound—at first a distant rumble and quickly a swelling swish—of sliding tons of snow, plunging at us with ever swifter speed.

But this avalanche was not for us. It thundered past, its powdery fringe burying our feet and ankles. We stood silent for a minute, watching the white swirl of destruction wear itself out on the ice flats below. Too close!

Up we crept over slopes of scree and along cliffs of ice and rock. We plodded through knee-deep snow soggy from the blazing sun. We chopped steps in ice cliffs, leaving safety ropes fixed for future use.

Finally we emerged dramatically through a hole in an overhanging cornice upon the hard-packed upper ridge of Mount Haydon. Nearby at 10,400 feet, we established Camp Nine and crawled into sleeping bags to await the scheduled arrival of the plane in the morning.

Stormbound for a Week

At seven we were awakened by the soft, dispiriting patter of powder snow on the tent wall. The square we had trampled out as aiming spot for the air delivery was completely erased. A strong southeast wind filled the air with blowing snow. We knew the plane would not arrive that day.

We could not have anticipated what came

Crossing on Mount St. Elias Stand on the Highest Point of Our International Boundary

Near the Top, Climbers Struggle up an Almost Vertical Pitch

From a Nest of Nelon Blizzard Tents a Climber Eyes the Distant Icy Coast

[illegible] alone at [illegible] Jan. [illegible] coast of Morgan [illegible] Times photo
[illegible] not to contain [illegible] in crash [illegible] Jerry [illegible] Ranger Flavin [illegible]

As Crowds Roll Across Jeff Bezos's Spacecraft, the Skydiver Plans Dive to Drop Supplies

Crews of Harpsichords, Lutes, Bagpipes, Sponsorships and Workbenches on Hayden Kruge

Lost Scouts Back from a Lost World, Weary Climbers Tell up to 'Wise Saint'

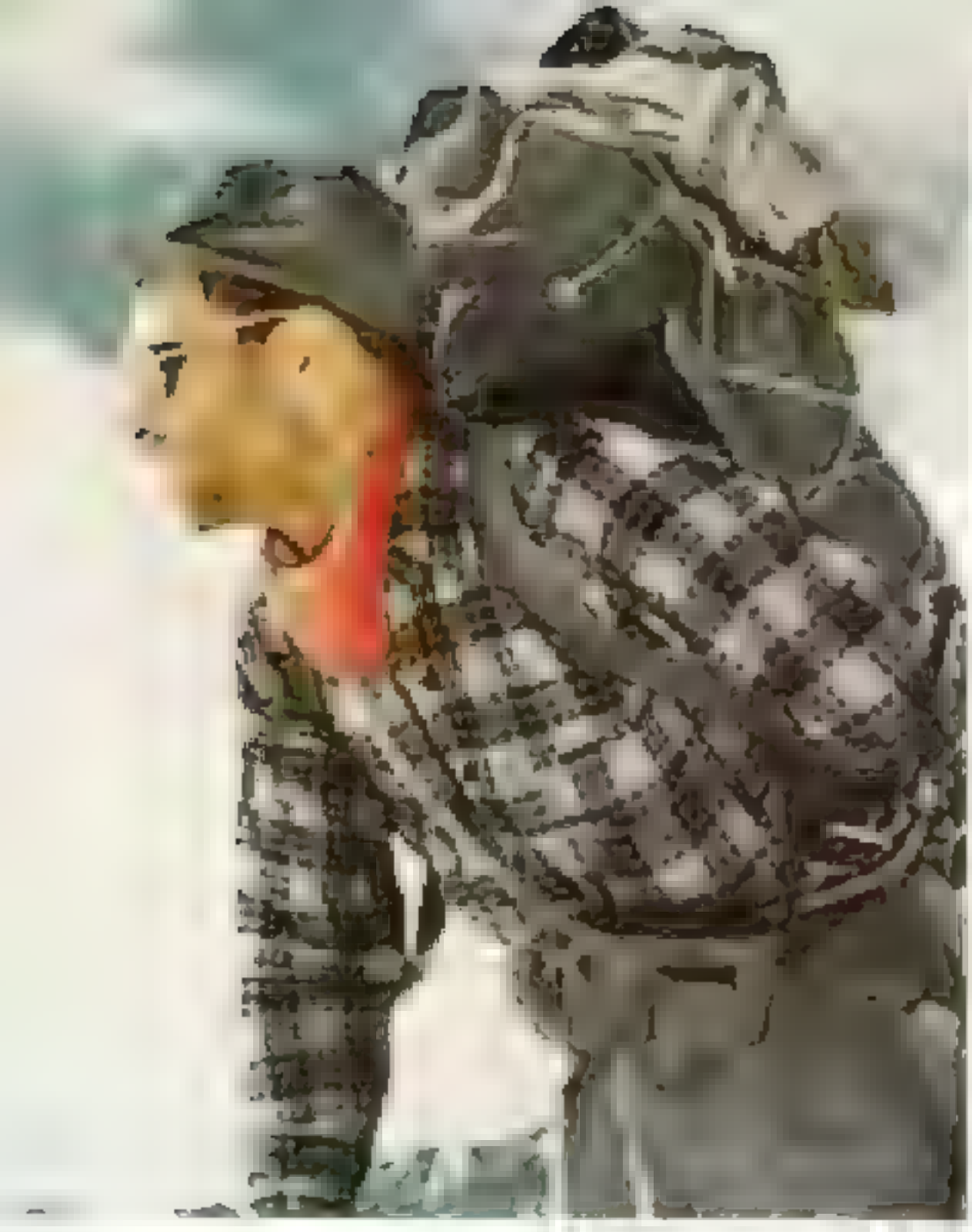
[illegible] Lee and Contrell as Mountaineers Plod up to Camp Ten, at [illegible] feet on St. Elias [illegible] back from placing a safety rope on a steep [illegible]

Razor-Backed Mesquite Hoodoos Increasingly Buttressed Spread in a Steppe-gulch on S. [illegible]

[illegible] Mesquite [illegible] slope (right) a giant snow mass, resembling white lava, settled under the climbers with an ominous crunch

[illegible] Troops Land in Sapporo, Japan. It Fell with Officers Scurrying to the Area Stamped Out to Receive the "Manna from Heaven" [illegible]

Atop Mount Erzgebirge Is a Beatnikless Face with Icy Whiskers — Mrs. Kornbluth and Two Companions Pause on the Natural Lookhead



Safe and Successful Mountaineering Calls for the Right Equipment, from Head to Foot

[illegible]

Spectacular Peaks Inspire Sketching at a Lofty Camp

[illegible]

to pass. For seven precious, irretrievable days a howling storm imprisoned the three of us in the tiny mountain tent. Several times we heard the aircraft circling above, trying to break through the shroud of driving mist and snow. But the storm kept us well hidden.

We played cards and guessing games. We ran "Twenty Questions" into the ground. We slept, we watched the weather, we fumbled in our packs for the harmonica that wasn't there.

Building a Snowhouse

With time to kill, Colossal Enterprises, Inc., built a snowhouse (Plate III).

My bedmate was a set of batteries. We had a "handie-talkie" which had hazed as voice contact with the plane at Camp Seven. I hoped warming the batteries would make the radio work. It didn't.

The skies were swept blue on the morning of July 8 (Plate III). It was still early when we heard the distant rumble of the DC-3. An hour later we had picked up 27 bundles from squarely within our newly tramped drop space—a magnificent job of precision "bombing" (Plate VI and page 248).

July 11 found us all reunited at Camp Nine. Before pushing on across the saddle linking Mount Haydon to the upper pyramid of St. Elias, we detoured to the summit of Haydon (Plate VII). It was an unclimbed peak and we couldn't pass up a first ascent!

From the slopes of Haydon, as from Camp Nine, we looked across three miles of space to the [illegible] \ brutal wall of almost perpendicular black cliffs and icefalls glittering white and blue-green. It was raked almost constantly by terrific avalanches. During daylight and evening hours our ears seldom were free of their thunder.

From miles away we watched blocks of ice, some big as houses, shatter into splinters as they bounced down the cliff.

Snow avalanches increased to a wild crescendo late in the afternoon on melting, sunny days. Ice slides from hanging glaciers, on the other hand, reached a climax of frequency twice a day, once each morning just after the sun hit the slopes and again in the evening when chilling shadows crept across the cliffs.

Since our route strictly avoided areas of bergschrund, séracs, and icefall, snow avalanches were our constant dread. We quickly learned that daytime travel was close to suicidal.

On the high slopes therefore, we would leave camp at about 9 or 10 o'clock and climb until sunrise. Then the snow surface was frozen and the firmer footing made for much easier walking. In early July, at this latitude, there was sunshine much of the night and always light enough to move by as long as it was clear.

Climbing Mount Haydon we had a fright. About halfway up a great smooth slope we felt the whole mass of snow beneath our feet suddenly settle with a crunch that set our spines tingling. A few feet above the head man a thin line of cleavage appeared, running horizontally across the steeper section ahead.

We stopped, feeling infinitely small and helpless. The snow mass we stood on seemed poised for flight and might easily carry all of us off the mountain to destruction on the glacier 6,000 feet down.

Gingerly but hurriedly we descended to a solid ledge and found another route to the top.

We had spotted from afar the logical site for our Camp Ten, on a prominent ice ledge at 13,300 feet on the great southwest ridge of Mount St. Elias proper.

To reach this station we climbed at night over difficult rock and ice. One 1,500-foot slope of naked blue ice demanded the utmost caution and required 400 feet of fixed safety rope (Plates IV and V).

Crampons (sets of steel frames studded with two-inch spikes that fasten on over climbing boots) were an absolute necessity. Thus shod, with ice ax in hand and properly roped, one can ascend ice slopes as steep as 80° (90° is vertical).

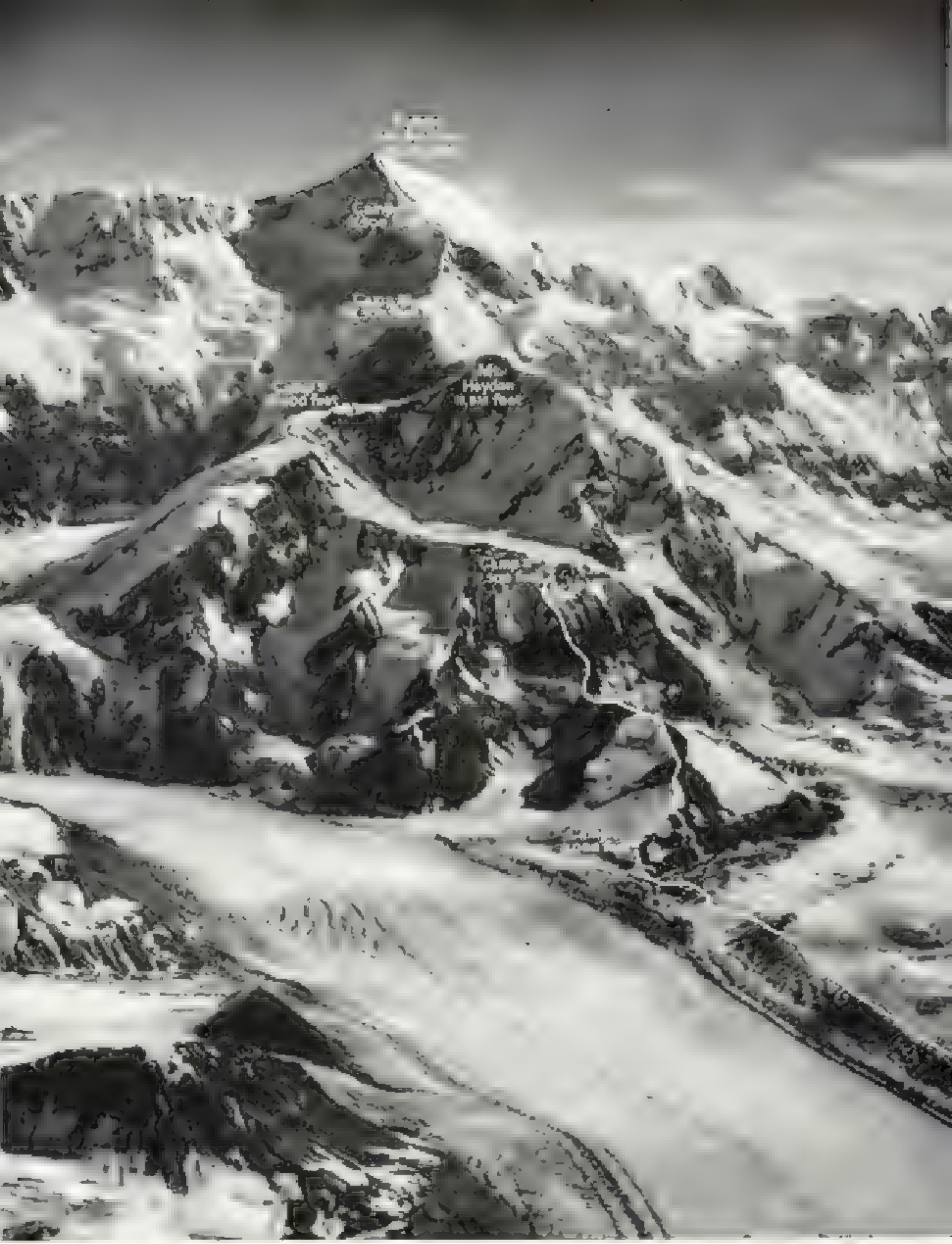
In climbing with crampons we were mighty careful to make sure that *all* the steel points were well imbedded in the ice surface. If you once slip on glare ice, it is virtually impossible to stop yourself. Even if roped, you may get well bruised and scratched.

For a Quick Stop, the "Self-arrest"

We followed standard practice of putting three men on the 120-foot nylon ropes. After waist loops and knots were made, this left 55 feet between climbers. The only purpose of the rope, of course, is to ensure that, if one man slips and falls, his firmly belayed companions can stop and hold him.

Had we slipped on steep icy slopes, we were prepared to throw ourselves immediately into the position of "self-arrest." You turn flat on your stomach, dig in the toes, and brace the ice ax along the side of your body with the pick point close to the shoulder dragging in snow or ice.

Crossing the blue ice mentioned above, Putnam and Ferris were chopping out steps sideways upward and across the slippery rise.



Trail to the Summit Is Traced on a Photograph That Helped the Climbers Plan Their Route

[illegible]

Putnam skidded suddenly and slid away down the steep face.

Ferris had taken a secure body belay and held Putnam safely. But the rope jerked tight across Ferris's body. The taut cord ripped his fine camera from its strap and sent it tumbling down the mountain.

At Camp Ten Captain Hohlman and his crew made the drop described at the beginning of the story.

After I had been pulled from the crevasse, and when we had resigned ourselves to the loss of four days' supply of priceless food, we enjoyed a pleasant surprise.

We opened one of the dropped boxes, half expecting to find cosmic-ray equipment which had been lost in the United States.

Imagine our delight at unwrapping four large and luscious apple pies, sent with the compliments of the Women's Bakers [illegible] 1937.) Each of us gobbled up a half pie in [illegible]

This unexpected treat could not have arrived at a more opportune moment. Then there was mail from home which fired everyone with new enthusiasm. My accident and the food loss were quickly forgotten.

We were all doing chores around camp when I looked over to where Bill Latady was sitting on an air mattress. He was bareleggeed and his feet were a gory red!

"Doc" Ferris, apparently sure at last of a patient, rushed over to see how in the world Latady had cut both his feet so badly. Bill just grinned and held up a pair of bright red wool socks he'd been wearing.

The bloody-looking dye had come off on his feet, which he had undressed for a stretch and an airing!

Determined to press on toward the summit before another storm blew in and caught us short of supplies, we pushed ahead through waist-deep snow and along a foghound ridge to locate our last and highest bivouac, Camp Eleven, at 15,500 feet elevation (Plate II).

Would the Weather Hold?

At our high camps, to which we had neither time nor strength to relay heavy loads, the chef might serve up the following for dinner: pea soup (from dried preparation), K-ration pork or dried shredded beef mixed with cheese and rice, dried sweet potato, and plenty of dried raisins, apricots, and apples.

To drink there was always tea stiff with sugar, as well as a choice of powdered milk, lemon juice, and hot chocolate.

With only two more full days' food remaining, the weather held our fate in its unpredictable hands. If we failed to get the break of clear skies within the next 48 hours, we should have to drop down to a lower camp for reinforcements.

If that happened, who could say if we'd ever get back up?

On the morning of the 15th although clouds hid the top thousand feet of St. Elias and a sharp wind was blowing, we decided to try for the summit.

Two of our little company were still below at Camp Ten. We started out in two ropes of three men each. Not ten yards from camp Kauffman, who had led off, let out a shout and nearly vanished into a gaping hole.

The frightening "who-oosh!" as the drift-curtained snow bridge he was crossing collapsed made us instinctively grab his rope and hoist him up to safety. The Saint was waging its war of nerves right up to the bitter end.

Mists Force a Retreat

During the excitement driving mists had closed in on all sides. We retired in defeat to the tents. Half an hour later snow began to fall thickly.

Toward evening a shout announced the arrival of Putnam and Ferris from below. The packs on their backs contained—bless them—a little extra food and gasoline for the camp stoves. If storm and circumstance demanded we now could stretch our rations to three days.

The morning of the 16th was biting cold, and the top of the mountain stood sharp-etched against a deep-blue sky. Wisps of blowing snow trailed off southward from the peak. That meant the north wind, the good-weather wind, was blowing!

"Kauff! Betty! Look at this!" I shouted gleefully, and my tentmates peered out to squint and grin at the bright day.

Our exclamations woke those in the other tents.

"Let's get out of here while we've got the breaks," someone cried.

By 7:30 we were roped and ready for the start. Each man carried a 30-pound pack of extra clothing and emergency equipment.

In contrast to the blue above, a tumultuous layer of clouds formed a churning floor below with icy peaks poking through here and there.

Working across the crevassed snow of the ledge and mounting a wall of rock, we topped the ridge itself. The full force of the wind was invisible ice. The route ascended steeply over sound rock. For a stretch there was little snow.

Above 16,500 feet the altitude began to tell. Wind, whipping powder snow, and the constant searching for secure handholds on rock faces proved more and more exhausting.

Merging East and West Across the Great Geyser Suggest a Woodly Pair of 'Long Handles'

[illegible]

From a Cliff-bound Lake of Ice Tumbles in Frozen Niagara

To Save Fuel, the Melt Tarp Was Spread to Convert Snow to Water

Melting snow over gasoline tent stoves consumed [illegible]. Mrs. [illegible] Kauffman watches [illegible] water trickle into a pail. The black [illegible] was [illegible]. Chunks of snow spread on the sheet melted [illegible].

We had to change leaders every hundred feet or so.

Dee Molenaar tapped me on the shoulder and pointed back along our trail. A lone figure was walking slowly across the lower plateau toward camp.

It was Bill Latady, who had a strained [illegible] picked up in action with the mountain [illegible]. He and the rest of us had known that this far high up might stop him, but the knowledge didn't lessen our disappointment that he couldn't participate in the last stretch of our climb.

"How Much Longer?"

Soon we passed over a series of bare [illegible] and [illegible] rocks. Upward led the trail over humps, across snow [illegible] and through gullies.

We struggled on, from terrace to terrace, dragging, floundering, climbing.

It was getting late, and the question in our heads came in words unspoken: How much longer?

Suddenly the edge ahead of me [illegible]. From beyond an ice hummock I heard Dee Molenaar's voice shout with excitement. "There are two more feet of rock and I'll be on top!"

His triumphant voice wafted out in the deep air and I knew we had won.

As the rest of the party climbed up and joined us on the summit I looked at my watch. It was ten minutes to four. We dropped our packs and shook hands.

Fatigue, headaches, numbing winds—all were forgotten in the overwhelming feeling of exultation. We had made it. We were on top!

The summit plain was half the size of a football field. We all moved over to a tiny rise that was the very highest point.

[illegible] Andy Kauffman [illegible], reaching over and [illegible] on Betty's back.

By conquering St. Elias this courageous girl had climbed higher than any other woman up to then in Alaska and Canada.

After our first excited [illegible] subsided, we gazed out over the whole awe-inspiring array of St. Elias Mountains' major peaks, thrusting up through the sea of clouds.

To the northwest lifted the enormous bulk of a mountain even taller than our 18,0[illegible]

Beards and Dark Glasses Disguise Mountaineers as Secrets Deep in Contemplation

[illegible]

[illegible]

[illegible]

Out of the Sky Fell Fresh-baked Pies, but Milk Came Only in Powdered Form

An airplane dropped [illegible]

U. S. Army Air Forces Official

Parachute and Load Throw Shadows on Snow Covered by Packages Already Dropped

Equipment that would break or crush was parachuted; other items were dropped free. An amusing [illegible] "Drop 4 below at Upper Lake" requesting delivery of three boxes of emergency rations at the next agreed spot. Packers for each plane were painted a different color.

foot pinnacle—Mount Logan, second highest, after Mount McKinley, of all North American peaks.

Mount Logan, towering to 19,850 feet, was discovered by the First National Geographic society Mount St. Elias Expedition of 1890, and named for Sir William E. Logan, founder of the Geological Survey of Canada.*

Flags Fly from the Summit

We stood on the international boundary between Alaska and Canada's Yukon Territory. We unfurled American and Canadian flags, donated by the Arctic Institute of North America. As they waved proudly in the wind, we fumbled with numb fingers to photograph the scene (Plate I).

To mark our achievement, at least until the next screaming blizzard, we hung as a trophy aerial the crimson banner of the Harvard Mountaineering Club.

Not until three weeks later, when we were all safely back to civilization, did we learn of an amazing coincidence.

That perfect day we had stood on the mountaintop was July 16, 205th anniversary of the day Vitus Bering's party first saw Alaska, sighted the white peak from 140 miles at sea, and named it for the patron saint of that day, St. Elias.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE "Conquest of Mount Logan" by H. F. Lambart, June, 1936; "Over the Roof of the Continent" (Mount McKinley), by Bradford Washburn, July, 1944, and "Fit to Fight Anywhere" (Quartermaster Corps Expedition to Mount McKinley), by Frederick Simpich, August, 1943.

Our Air Age Speeds Ahead

By F. Barrows Colton

Pilots [illegible] ago when the manager of National Airport at Washington, D. C., installed parking meters around the traffic circle in front of the main building, where people drive up to put friends on planes or make brief visits.

"I had to do it," explained the manager. "Why, people were coming over here and parking their cars for three or four days while they went to Europe!"

That shows, as well as anything, how commonplace air travel has become, how completely the Air Age has arrived.

This age of flight, in which the human race is conquering the great overhead ocean of air, earth's last frontier, is developing as fast as scientific research and available funds will permit.

Man is learning to live, travel, even earn a living, and if necessary defend himself far up in what some flyers call the "New Sea," where Nature never intended he should go.*

Today a plane exists that is designed to carry its pilot to the breath-taking altitude of 80,000 feet, 15 miles, well beyond the [illegible] (the National Geographic Society-U. S. Army Air Corps stratosphere balloon *Explorer II*, which now holds the altitude record for human flight.†

That sky-climber is the rocket propelled experimental Air Force plane the XS-1, built to fly 1,700 miles per hour, more than twice the velocity of sound.

Babies Born in Flight

Whether or not you ever ride in airplanes aviation is fast changing the world you used to know. Several babies already have been born in planes in flight!

Some New York businessmen, living in outlying suburbs, now get to work in 15 minutes by air instead of in over an hour by train, subway, or ferry. Their only complaint is lack of time to finish reading the morning paper!

Every minute of every day there are approximately 100 tons of mail in the air over the United States.

There are now helicopter mail deliveries and taxi service. Airplanes are used in counting wild ducks and game, in spotting poachers, who sometimes use planes themselves, and in reseeding denuded western lands.

Prisoners, deportees, migrant laborers, seasonal fruits and vegetables are now carried by air. Plates are used to tow advertising signs, patrol pipe lines, shoot coyotes, and spray bodies of water to keep down mosquitoes.

[illegible] of Pennsylvania's great high-speed auto turnpike from Harrisburg to Philadelphia are being made with aerial photographs. It is estimated that various U. S. military and civil agencies alone have photographed 18 to 19 million square miles of the earth's surface from the air, one third of the total land area.

Bad weather, the old bugaboo of aviation, is being conquered. Most of the leading airports of this country soon will have equipment for enabling passenger-carrying planes to land under conditions that previously would have halted all flying.

There used to be a rueful parody on the famous Air Corps song, "Nothing can stop the Army Air Corps (except the weather)!" But that's no longer true. Almost daily for a year and a half, pilots of the Air Force's All-Weather Flying Project have flown the 750-mile round trip from their base at Wilmington, Ohio, to Andrews Field near Washington, D. C., without ever seeing outside the cockpit.

They have flown in all kinds of weather. When it was clear, special opaque windshields and goggles kept them from seeing outside. Every flight, including take-offs and landings, was made entirely with the aid of instruments.

A Seattle inventor has developed a one-seater helicopter, a sort of aerial motorcycle, which weighs only 125 pounds, has a speed of 90 miles per hour, and a cruising range of 200 miles.

Other inventors have developed combination automobile-airplanes (page 258). One is called the "airphibian." You fly it to the airport of your destination, land, take off the wings, tail and propeller, leave them at the field, and drive the fuselage into town like any car.

Radar Devices Warn of Danger

Radar devices that penetrate fog and darkness to warn of ground below or mountains ahead are rapidly coming into use on commercial airliners and soon will be required.

Scientists now foresee the time when, flying [illegible] jet engine, you may leave New York at noon eastern standard time and reach San Francisco *before* noon, at 11:00 a. m. Pacific time!

* See "New Frontier in the Sky," by F. Barrows Colton, National Geographic Magazine, September, 1948.

† See "Man's Farthest Aloft," by Capt. Albert W. Stevens, National Geographic Magazine, January, 1936.

In Today's Air Age an Old Familiar Sign Has New Wording—"Airplane Crossing"! [illegible] Lake [illegible] Grosse Pointe, New York, where a railroad crossing could be eliminated

Only 22 years ago, when Rear Admiral (then Lieutenant Commander) Richard E. Byrd first flew an airplane over the North Pole, he was awarded the Hubbard Medal by the National Geographic Society.*

Today U. S. Air Force men fly over the North Pole three times a week. They have reported finding three north magnetic poles instead of one. Only recently the Air Force announced that it is ready and able to fly "anywhere, any time" in the Arctic.

Some 75,000 Americans today, including many farmers, own their own personal airplanes for use in pleasure business, or both. Private airplanes may increase to a total of 400,000 by the 1960's, says T. P. Wright, head of the Civil Aeronautics Administration, if someone develops a reasonably priced light plane which will be really useful to its owner.

Just seven years ago, in 1940, I wrote an article in an attempt to tell of what it took to fly across almost as out as late as the horse and buggy. Then it took 18 hours or more to fly from coast to coast. Only a few airliners had more than two engines and most cruised at no more than 180 miles per hour. Today most long-distance transport planes have four engines, an average cruising speed of 300 miles per hour, and can cross the continent in about 10 hours.

Seven years ago the fastest U. S. fighter planes still in the experimental stage did not fly more than 400 miles per hour. Now the new jet-propelled fighters zip through the sky at [illegible] better, and unpiloted jet-driven [illegible] have actually flown far beyond the speed of sound at 1,500 miles per hour.

Flying as Fast as a Bullet

Flying at 650 miles per hour to set a new world speed record, the Navy's experimental jet plane, the Skystreak, traveled at approximately the speed of a 45-caliber pistol bullet, or as fast as the earth turns at the latitude of London, England, or Winnipeg, Canada. Flying at that speed and in that latitude, the Skystreak would keep up with the sun and [illegible] the world in a day if it could carry enough fuel.

Scientists are now attacking the problem of [illegible] atomic energy [illegible].

* See, "[illegible] Navy's Jet Plane Skystreak Flies Far Faster to the North Pole," by Rear Admiral Richard E. Byrd, [illegible] and Pioneer, the Hubbard Gold Medal.

See "Aviation in Commerce and Defense," by [illegible], National Geographic Magazine, [illegible]

Hovering over the Sea, This Navy Helicopter Could Rescue a Boatload of Men

[illegible]

[illegible]

"Right on the Beam" a Plane Comes in "Blind" over the Radio Set That Guides It

With the pilot unable to [illegible] weather, this Air Force All-Weather Flight [illegible] with the aid of the radio [illegible] Landing System (ILS), in which the pilot [illegible] path down to the field [illegible]

Carrying cargo by air in 1940 still was relatively a minor item compared to airline passenger traffic. But experts predict the time is coming when the airlines, like the railroads, will derive more income from carrying cargo than passengers.

In 1940 we were just beginning to explore the upper depths of the "New Sea," the vast ocean of air in which aircraft operate. Today's new big bombers are built to fly at 50,000 feet, and V-2 rockets, soaring to more than 100 miles, have for all practical purposes "penetrated beyond" the atmosphere, for even far below that height the air is so thin that it is quite close to a high vacuum (page 249). The Navy's Neptune rocket is designed to climb to 235 miles.

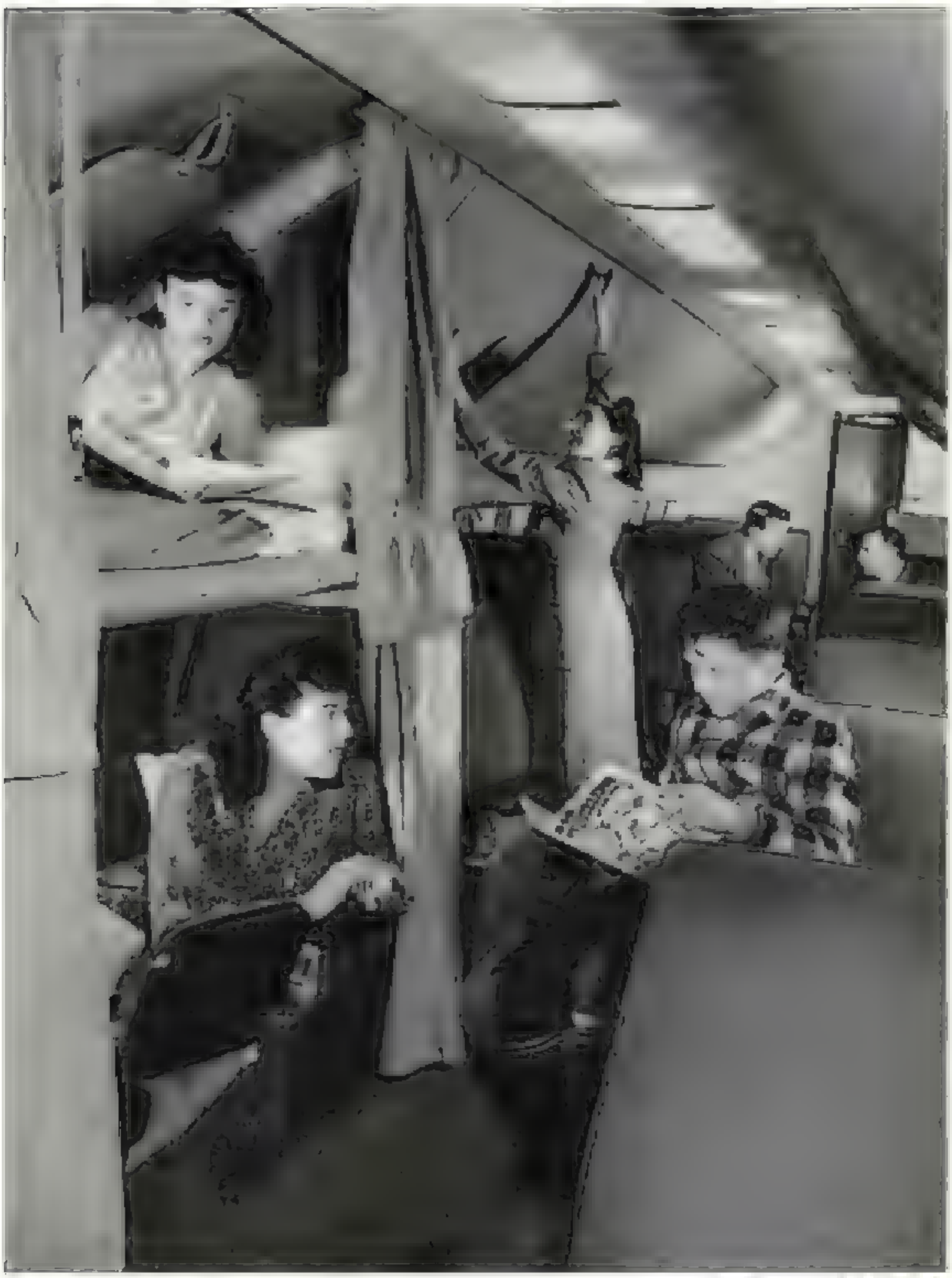
Already a course in rocket navigation is being taught by an astronomer at the University of California. Thus aviation has begun to think about leaving the earth entirely and venturing out into the astronomer's world of outer space.

Real progress is being made now in overcoming the problem of bad weather, the greatest handicap to safe and regular operation of commercial airlines.

Not long ago two planes of different lines approaching San Antonio, Texas, found the field covered by clouds hanging too low to permit a safe landing under normal procedure.

One plane, after futilely circling the field, had to land at Houston, many miles away.

The second, however, made a safe landing at San Antonio on schedule. It was equipped with radio receivers enabling the pilot to make use of the U. S. Government's Instrument Landing System (ILS), now being installed



Berths Are Made Up Pullman Style on a Transatlantic "Flying Sleeper"

[illegible]

On Moving Day Now, You Can Fly Your Furniture

[illegible]

at all major American commercial airfields.

Today ILS is pilot coming to a large cross-[illegible] airport with the aid of [illegible] localizer radio signals that show an aircraft is aligned toward the invisible runway below. There he flies down a radio beam glide path, which guides him automatically to the end of the runway where he can land.

Automatic Landings Foreseen

Many commercial airlines now have equipped their planes with ILS receivers and are following suit. So equipped, they are permitted to land under conditions of lower ceilings and less visibility than otherwise would be allowed. As they gain experience with ILS, they will be authorized to land with its help under increasingly difficult conditions.

ILS has been accepted for use all over the world at commercial airports by the International Civil Aviation Organization (ICAO).

Next step after ILS will be "automatic landing," a combination of ILS with the plane's automatic pilot. Jets would soon fling a plane earth and accurately down to earth under conditions of zero visibility and zero visibility. The workability of such a system has been proved by the U. S. Air Force "guided missile" [illegible] which an experimental plane already has flown itself across the Atlantic to England and back with the crew merely sitting by.

Another "zero landing" system, now in use by the United States Air Force, under test by the Civil Aeronautics Administration is Ground Controlled Approach (GCA), which is operated by radar and radio. Another beam sweeping at rate of 50 miles [illegible] an airport, along on the [illegible] the [illegible] and [illegible] a [illegible] that [illegible]

The GCA operator watches his screen.

That Distant Lake Where the Fish Are Biting Is Easy to Reach by Air

A couple in the [illegible] rather brought with them in their own plane, this couple [illegible] for [illegible] Lake. Equipped with pontoons, light planes can see a body of water for landing

gives instructions to the planes by radiotelephone. As the planes approach the field they are picked up on the [illegible] short-range radar. Then an operator takes them down," watching each plane on the radar screen as it comes down toward the runway and telling the pilot how to correct his course to stay on the correct path to land safely.

More amazing than either Hi-Ex or GCA perhaps is Teleran (Television Radar Air Navigation), which enables a pilot actually to see the terrain below. A camera on the ground picks up all aircraft in its vicinity and shows them on its screen.

A miniature view of the screen is sent by television to each plane. Each pilot sees on his television screen dots of light that represent his own and other planes near him, with his own marked in a special way, showing its exact place.

On the screen is a line that directs him to the proper runway and he can find his way down by watching the movements of the spot representing his own plane as he glides to a landing. Teleran is still under test.

To guide airplanes [illegible] field or another, the CAA is rapidly [illegible] the United States with new radio ranges [illegible] frequency. On a map [illegible] radio ranges look like [illegible] which will [illegible] overlapping these areas [illegible] radio sending station on a mountain or [illegible] point. Each "spoke" is a radio beam [illegible] certain direction.

A pilot flying east, from Chicago northwestward to Minneapolis follows the spoke in Chicago radio range that points most directly toward Minneapolis [illegible] the Minneapolis [illegible] following two [illegible] on this way [illegible] his way unerringly between any two points in the United States. A right-left needle on a dial in the cockpit

[illegible]

Navy's Skyrocket, Built to Fly near the Speed of Sound, Resembles a Swordfish

[illegible] The sharp "lance" on the nose contains [illegible]

shows the pilot whether he is "on the beam" or off to the right or left.

With these new ranges, too, parallel [illegible] at various levels can be set up [illegible]

Operating on very high frequency, the new radio ranges cannot be distorted [illegible] by static. The old low-frequency [illegible] which the new ones are replacing [illegible] weather when they were needed most.

Radio Guides Fliers Across Oceans

To guide large airliners crossing transcontinental [illegible] stops, still another type of radio navigation aid is being [illegible] to follow a [illegible] course across land or sea without bothering with the short-range [illegible] radio beams.

As another aid to guiding airplanes across the oceans, the wartime magic of Loran (Long-Range Navigation) is coming into peacetime use. With a special receiver in the plane the navigator picks up two radio signals sent out from widely separated radio stations on shore.

From a quick calculation of the difference in the time of arrival of the two signals, even though [illegible] the navigator can determine with great accuracy his exact position, making him independent of [illegible]

Keeping watch [illegible] across the North Atlantic are [illegible] weather [illegible] ships [illegible] weather reports [illegible] ready [illegible] to the [illegible] planes [illegible] in the sea [illegible] U. S. Coast Guard cutter *Bibb* saved [illegible] persons from the flying boat *Bermuda Sky Queen* when it was forced down on heavy seas last autumn.

Just before World War II the [illegible] began [illegible] a Nation-wide system of air markers [illegible] on the ground, which [illegible] show any pilot [illegible] the direction to the nearest airport [illegible]

When war came these markers were removed lest they be useful to enemy aircraft.

Rival for Navy Planes and Guns: A V-2 Rocket Is Fired from the Carrier *Vulcan*

[illegible]

With a "Flying Automobile" You Can Travel by Air or Highway

A passenger cabin of the experimental craft, including wings, tail, and airplane engine, may be detached from its lower part, which then can be driven on the ground, using a separate motor. It is intended for a combination personal aircraft and car. The four wheels have shock absorbers for landing (page 260).

but now they are being reinstalled. An arrow points due north with the latitude and longitude on either side of it, and another arrow indicates the direction and distance to the nearest good landing field.

Hot air, blown through hollow spaces in the leading edges of wings, control surfaces, and propellers, is used on newer aircraft to prevent formation of ice, which otherwise can spoil the lift of a plane and throw it out of control. Formation of ice on windshields is prevented by use of a new glass containing salt crystals that conduct electricity through the glass.

Birds crashing through windshields and disabling pilots are a real hazard, especially on the great mid-continent "flyways" over which birds migrate in spring and fall; so Government researchers have developed "bird-proof" windshields. Chickens first killed by electrocution are hurled with air guns against experimental windshields at speeds up to 500 miles an hour to reproduce the impact of a bird in flight.

Noise of airplanes, which often has annoyed residents along the borders and approaches of airports, also is being attacked by researchers. An experimental almost-silent aircraft engine has been flown by scientists of the National Advisory Committee for Aeronautics (NACA). Propellers, which cause most of the noise, are being redesigned with more blades and slower speeds.

Air Cargo Comes of Age

Shipment of cargo by air is one important way in which the Air Age is changing civilization. Almost every conceivable article has been shipped, by air, from young elephants to live lobsters, ribbon, and eyebrow pencils (page 264).

Today, if a department-store manager in Des Moines or Dallas wants to try out a dress representing a new fashion trend on his customers, he need not order a large quantity from his New York wholesaler, taking a chance on a loss if they don't sell. Instead he can order a few, advertise them, and then if they begin to go like hot cakes, order more sent out overnight by air. Moreover, dresses in large quantities can be shipped on hangers, arriving unrumpled and not in need of pressing.

Some 2,000 firms, operating 4,400 planes and employing 8,400 pilots, are authorized to carry air freight and passengers on a nonscheduled basis in the United States. The regular scheduled airlines, too, all carry freight

[Wide World]

Nicknamed the "Flying Pancake," This Experimental Navy Plane Is Round and Flat

Intended for use as a fighter, it is designed to fly as fast as 440 miles an hour and, to slow down to 40 miles an hour or even less. Its flying-wing shape minimizes drag. The designer originally set out to build up a craft which would perform both as an airplane in high-speed flight and as a helicopter flying almost vertically in getting in and out of small landing spaces.

along with passengers, and some operate separate freight airplanes.

Air freight is flown regularly overseas. There are even "tramp" air freighters that ply the air routes as tramp steamers ply the oceans, picking up cargo wherever it is available.

But passenger carrying today still is the main business of the airlines. More than 700 airplanes, three times the number in use before the war, now are flown regularly by the scheduled airlines alone in the United States. Across the Atlantic there is an average of about 60 airline flights each way per week, and over 30 each way weekly across the Pacific, contrasting with two before the war (page 255).

Some of today's big four-engined planes have two decks and include a lounge with snack bar. Hot beverages can be prepared on board, and in some cases meals are cooked on the ground, frozen, then thawed and served in the air hot and fresh. Men's and women's separate dressing rooms have washbasins, hot and cold water, dental bowls, full-length mirrors, and dressing tables.

Such planes seat from 50 to 80 people and some can sleep as many as 28 in berths. One has a private compartment with its own bathroom. Cabins are "pressurized," which means the air within them is kept at a pressure equal to that at about 8,000 feet altitude, permitting normal breathing while the plane flies at 18,000 feet or higher where the outside air is too thin to sustain normal life.

Commuters Travel by Air

Air commuting is well established. Congressmen, businessmen, and others who make regular trips between cities such as Washington and their homes keep standing reservations on certain airline flights every week.

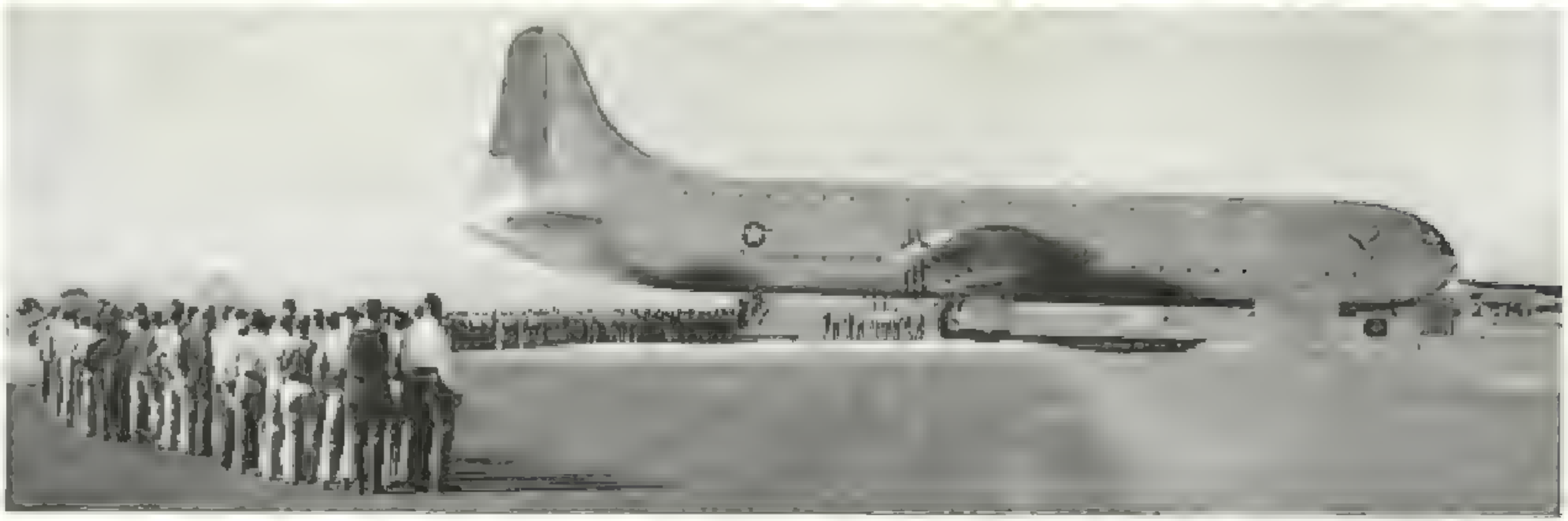
Despite occasional accidents, airline travel is considered safe enough today so that most insurance companies charge no higher rates for it than for other modes of travel. By inserting coins in an automatic vending machine, you can buy an air travel life insurance policy for 25 cents per $5,000 up to $25,000 in the waiting room of your airport terminal and mail it, in an envelope that is thoughtfully provided, to the beneficiary!

Airlines today cover the earth with a 500,000-mile network that reaches practically

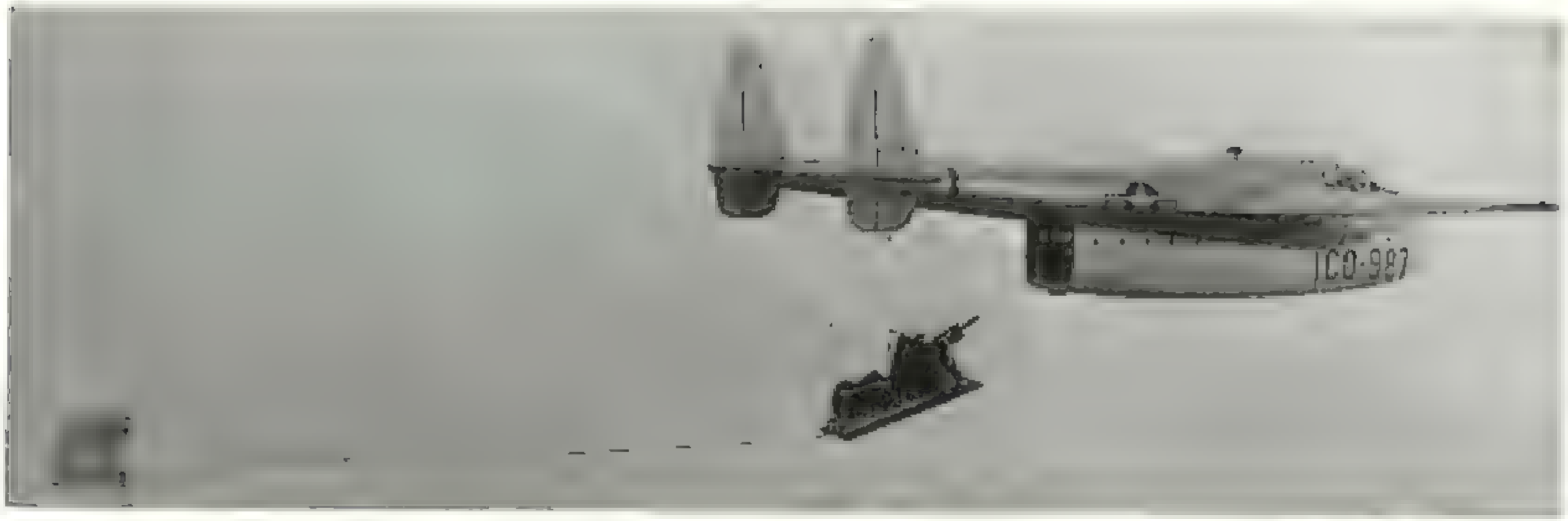
Appearing Like a Huge Winged Dragon in Flight, the B-36 Is More than Twice the Size of a B-29

World's Largest Airplane—the Howard Hughes Flying Boat, Built Mostly of Wood, Makes a Trial Flight

Powered by eight [illegible] engines [illegible]



These 400 Men, or 50 Tons of Cargo, Could Be Carried in the NC-99, Which Has Two Decks and an Elevator



Even the Artillery Soon May Be Prepared to Fly, Dropping Guns by Parachute, in This Airborne Age

A 107-[illegible] stabilizer to close it.

Resembling Some Prehistoric Bird, the YB-49 Jet-propelled Flying-wing Bomber Trails Smoke on Its Take-off

[illegible]

Inside Wings, Set Back at an Angle, May Help This XP-67 Jet-propelled Bomber Fly Nearer the Speed of Sound

U. S. Air Force Photo

Low 10-pound Jet Motors Run This Air Force Helicopter, the "Flying Motorcycle"

[illegible] second by the thrusting power of their jets of hot gases, eliminating need of heavy rotor parts. In the [illegible] observation, communication, artillery spotting, and courier service.

every nation, and make international ports of call out of such inland cities as Chicago and Kansas City; Asunción, Paraguay; and Madrid, Baghdad, and Fairbanks.

[illegible] that taken recently by your Society's President, Dr. Gilbert Grosvenor, when in five weeks he flew to Norway to welcome a new grandchild; to Istanbul, Turkey, to revisit scenes of his early boyhood; and back to New York, circling Mont Blanc on the way, in time to attend his fiftieth Amherst College class reunion, with plenty of stopover time en route.

Returning, he flew from Shannon, Eire, to Gander, Newfoundland, in 6 hours 50 minutes averaging 356 miles per hour at 18,000 feet, a good example of the speed of travel in this Air Age.

This global airline network is serving in very practical ways to bring about everyday, down-to-earth "International understanding." A plane today on a one-way flight may operate over as many as 15 countries.

One of the great hindrances to international air travel is red tape.

Through the International Civil Aviation Organization and International Air Transport Association efforts are being made to cut red tape. They are trying to bring about the use of certain standard languages in air communications, adoption of standard systems of weights and measures, uniform procedures in handling passengers, mail, and cargo, standard regula-

Dusting Maine Blueberries: a Helicopter Flies Only a Few Feet above the Crop

Chemicals to protect the berries from mildew and insects have been sprayed on [illegible] in this way. Lint is fed from hoppers into the downwash [illegible] the [illegible] which carries it on to the plants. The helicopter flies from five to 10 feet above [illegible] 3 to 10 miles per hour.

[illegible] and transmission of diseases by air. Even passenger liners [illegible] and convenient as possible.

"We're trying to fix it," one air transport man explained, "so that, for example, a Venezuelan [illegible] Brazilian [illegible] aircraft, having a bad weather [illegible] with the skill of an American-trained [illegible] flying system supervised by a Czechoslovakian [illegible] without [illegible] a [illegible] be an emergency."

For general usefulness and versatility no aircraft can vie with the comparatively [illegible] angainly helicopter. Only about 10 years [illegible] Today it does almost everything that a man [illegible] first inspired men to [illegible]

Helicopter, Jack-of-All-Trades

In Argentina, [illegible] depredations. They have set down forest fire [illegible] that trapped and injured men.

They have sprayed orchards in Sweden, dusted potatoes in Aroostook County, Maine, and spread DDT on Buffalo, New York,

Giant Multiple Landing Gear of the B-36 Superbomber Dwarfs the Man Who Flies It

[illegible] feet high, support the [illegible] which weighs 65 tons empty. [illegible] distributed [illegible] Wing span is 230 feet. It is [illegible]

dumps to kill flies suspected of spreading polio. They have saved cherry orchards in California, wetted by an off-season rain, from heavy loss by flying slowly three feet above the treetops. The downdraft of the spinning blades blows the moisture off the fruit, which would have been injured if the sun had warmed it while still wet.

They have laid pipe lines in places difficult to reach by land for the Army Engineers, served as lofty vantage points for Connecticut State Police officers to unsnarl traffic jams not visible in their entirety from the ground, and carried movie cameramen aloft to take thrilling action shots.

For the Air Force, Army, and Navy they carry messages where radio cannot be used, landing easily on a battleship or cruiser, and perform reconnaissance and rescue work impossible for faster aircraft, since a helicopter can land in any small space, even on water, can hover a few feet off the ground, and can fly slowly enough for careful observation of ground objects (page 251).

Personal airplanes and private flying have a great future, Government aviation experts believe, despite the fact that the production of private planes recently has decreased considerably since the period immediately after the war.

One problem is that, as shown by a recent Government survey, the largest part of private flying is done by young people, who usually are least able to afford to own and operate an airplane.

More miles are flown yearly in the United States by private aircraft than by those operating on the commercial airlines. Flying schools now are operating in all the 48 States, Hawaii, and Alaska, though many of these depend chiefly on veterans learning to fly under the GI bill of rights.

"Flying Farmers"

Farmers and ranchers use planes to check the extent of soil erosion on their land, since the beginnings of gullies and other signs of trouble can be spotted readily from the air. They use planes also to check fences, condition of the range for grazing, and to locate cattle, sheep, and lost lambs. They have flown an average of 247.2 hours a year, an unusually large use of personal planes. Several active "Flying Farmers" organizations exist.

Two Piper Cub light planes, equipped with extra gasoline tanks, radios, blind-flying instruments, and gyrocompasses, last fall flew around the world. Several members of Congress who are light-plane pilots have their own flying organization.

In Brazil I met a Presbyterian missionary who has a small plane, equipped with a stretcher, which he uses to visit scattered congregations and to transport the sick from remote interior villages to hospitals. Catholic priests of the Oblate Order have learned to fly so that they can use planes in their mission work in Canada.

Never before in all his experience has man had to deal with conditions like those encountered both by airplanes and by the human body itself in the process of flying at the terrific speeds and dizzy altitudes that today's aircraft already have attained or soon will reach.

When the Navy's experimental plane, the Skystreak, flew at 650 miles per hour, air friction heated the cockpit to a temperature of 170 degrees F. A refrigerating system had to be installed which reduced the temperature to 105, more nearly bearable for the pilot.

Ever-present, too, all through the atmosphere, invisible but menacing, is the pounding, smashing, turbulent force that engulfs an aircraft when it nears the speed of sound. Air molecules, pushed ahead of an airplane wing like the bow wave of a ship, cannot get out of the way fast enough when the speed of sound is approached. The smooth flow of the air back over the airplane wing is disturbed. Eddies are formed that batter and tear at the aircraft structure, and can damage the surface or even throw the plane out of control.

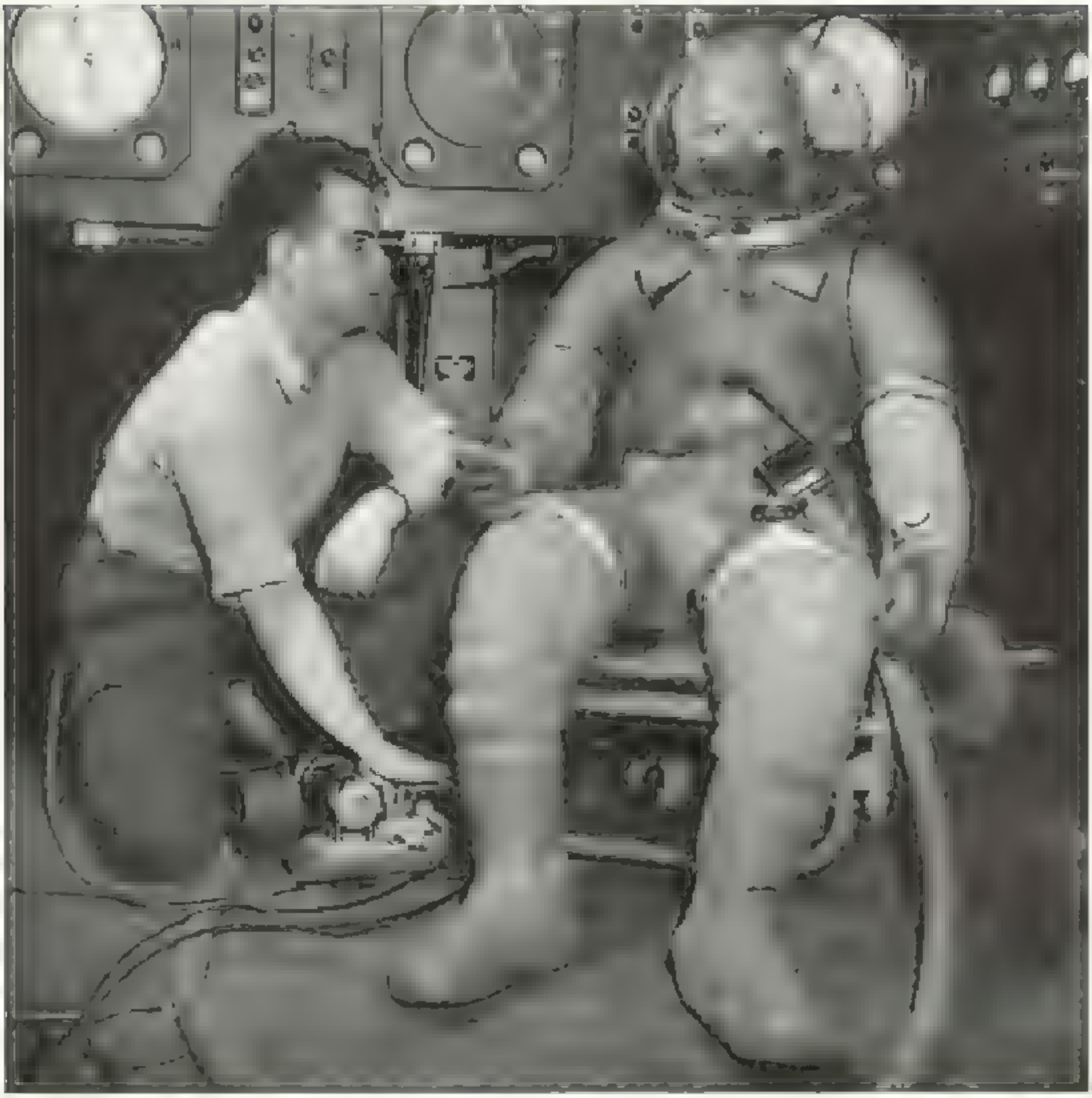
To overcome this danger, wings of fast fighter planes today are almost as thin and sharp as knife blades, enabling the plane to slice through the air with a minimum of disturbance.

Already planes have flown very close to the speed of sound. This speed varies with temperature, 760 miles per hour in the warm air near sea level but only 660 in the colder air at 35,000 feet. Strangely enough, once a plane is flying well beyond the speed of sound, the turbulence of the air flow disappears and the buffeting forces cease.

Strange Perils of the Upper Air

Airplanes can be built to withstand and overcome the strange conditions met aloft, but the human body is not designed to cope with them. Hence the new science of aviation medicine has developed ways of extending the body's capacity by artificial means.

Send an unprotected man above 10,000 feet and he is breathing air so thin that it does not contain enough oxygen to enable him to function normally. His mind will be affected by the lack of oxygen, spoiling his



Sealed in a "Pressurized" Suit, a Pilot Can Fly in a Near-vacuum [illegible]

[illegible] temperature. Intercepted that will [illegible] the Air Force's bids to [illegible] precaution. But normally breathing air is pumped into the suit and kept at a [illegible] feet (pressure feet above sea level [illegible]

judgment. If by some chance he should reach an altitude of 63,000 feet without freezing in the 75 to 90 below zero cold, his blood will boil as a result of the decreased atmospheric pressure.

[illegible] protection control and he tries to [illegible] speed he may [illegible] by the [illegible] stream. If he [illegible] his [illegible] he may be [illegible] hour. [illegible] the dish from his face [illegible] he does get clear, flatten him against the tail of his plane.

Even if he does somehow escape, the shock of the opening of his parachute [illegible] of fast fighter planes today are [illegible] to use the [illegible] when a pilot needs to bail out he [illegible]

U. S. Navy Photo

Earth's Curve and Gulf of California Show in a Picture Taken 100 Miles Aloft

Staged [illegible] Navy [illegible] Missile [illegible] Gulf of California [illegible] Pacific Ocean [illegible] the [illegible] the [illegible] the [illegible] below.

[illegible] literally blast [illegible] and [illegible] lifted [illegible] clear of the plane.

"Bailing Out" Inside a Capsule

Before he [illegible] pulls down a [illegible] like that on a [illegible] jet [illegible] into the jet stream. Still in his seat he falls free to a safe altitude, at which an [illegible] device works [illegible] pressure opens his parachute. Meanwhile he breathes through a mask coupled with [illegible] oxygen to get him [illegible]

A similar protective [illegible] equipped with a special suit, "pressurized" to protect them from the effects of low atmospheric pressure [illegible].

"The next step," says Maj. Gen. Malcolm C. Grow, the Air surgeon, will be to place the pilot inside a transparent capsule, air-conditioned, pressurized, and supplied with oxygen. When he needs to bail out, the whole capsule [illegible] will [illegible] clear of the plane.

He will [illegible] capsule, thrown [illegible] altitude where he [illegible] without [illegible] much of a jerk. The [illegible] will [illegible]

Rocket-propelled Missiles Like This May Be Fired at Hostile Planes Effectively

[illegible] a test model of the Air Force's GAPA (Ground-to-Air Pilotless Aircraft) cruises aloft at supersonic speed. Development of various types of guided missiles is under [illegible]

proof, in case he should land in the ocean, and will be supplied with emergency rations, water, and perhaps a life raft.

Studies are being made of the possible effects of cosmic rays, powerful ultraviolet rays from the sun, and meteors not dangerous in the lower atmosphere but which may be a real hazard in very high altitude flight, where the air overhead is too thin to serve as a protective screen. Your Society, with the Hartel Research Foundation of the Franklin Institute, is working with the Air Force on a study of cosmic-ray effects.

The Navy, like the Air Force, has jet-propelled fighters, has fired at least one V-2 rocket from a carrier deck, and is preparing for the use of long-range rockets and guided missiles, fired from ships.

Bombers Can Refuel in Air

[illegible] After flying almost to the limit of their fuel capacity to attack a distant target, bombers might rendezvous with tanker planes to take on fuel for the journey home, though this would not be practical for huge formations such as the 1,000-plane fleets that hit some German cities.

New bombsights for pilotless aircraft that may operate by automatically taking bearings on certain stars as a guide to the accurate dropping of bombs are being considered by designers.

New machine guns with far greater speed of fire have been developed for the new jet fighter planes. A pilot of such a plane making a head-on attack at 600 miles an hour against a bomber traveling at similar speed would have only two seconds to fire after coming within range before he would have to turn aside to avoid colliding with his target!

Guns also are recessed almost wholly within the aircraft's "skin," for if they protrude they cause so much drag that the plane is slowed down beyond the point of usefulness.

Radar already is being used to figure range and automatically keep guns pointed at the target. The next steps may be to develop bullets or other projectiles that ride some kind of beam to the target or that perhaps contain within themselves a device that guides them to it.

Today's fast military aircraft are driven by rocket or jet propulsion engines, which move forward by reacting against the thrust of a jet of hot gases streaming rearward from a nozzle. Both rocket and jet engines get their power from the burning of a mixture of oxygen and some form of fuel such as oil or alcohol.

Jet engines carry their own fuel, but get oxygen by scooping in air as they go, which is compressed either by a turbine near the intake or by the forward speed of the engine itself.

Rockets carry both fuel and oxygen in tanks, and therefore are independent of the air around them and can operate at great heights where the air is too thin to supply enough oxygen for jets. They can even travel in outer space where there is no air at all.

Future Jet Planes May Burn Metals

Jet engines burn fuel at a terrific rate, and jet-powered aircraft flying at the speed of sound have little room for fuel in their thin, knife-sharp wings and small fuselages. This limits their flying range; so jet-powered fighters of the future may burn, not gasoline or fuel oil, but metals such as bits of aluminum in powdered or liquid form that provide far higher energy than oil for the same volume. Some planes may eventually use atomic power, which has 50 million times more energy than gasoline!

All American jet powered aircraft today use the turbojet engine, in which the blast of hot gases within the engine turns a turbine wheel that operates an air compressor at the air intake in front. Blades on the turbines must stand temperatures so great that they melt ordinary metals; so new materials composed of metals and ceramics bonded together are being developed.*

Another type of jet engine is the ramjet which has no air compressor. When it gets up to 400 miles an hour its speed alone "rams" air into its forward end hard enough to compress it for burning with the fuel. Since ramjets won't work at less than 400 miles per hour, they will be used on planes or guided missiles that employ some other kind of power to get them up to the speed at which the ramjet begins to function.

Guided Missiles, Weapons of Future

Guided missiles and rockets, operating without crews by remote control and launched from one continent against another, still are far in the future, experts agree. One difficulty is that not even with the best maps available could a long-range missile be preset to hit accurately a spot several hundred or thousand miles away.

Meanwhile, however, scientists are pushing development of guided missiles (page 270).†

* See "Steel Master of Them All," by [illegible], National Geographic Magazine, [illegible]

† See "Air Power for Peace," by [illegible] Army H. H. Arnold, National Geographic Magazine, February, 1946.

Source: [illegible]

Source: Rocket Power, This Guided Missile Is Training for a New Kind of Combat

Developed for experimental purposes, the 14-foot model is being launched by a "rocket booster" the tube. The device with fins attached to the tail. The [illegible] the missile to 600 miles per hour in three and one-half seconds, then drops off and an internal rocket engine takes over the propulsion. This missile is named Tiamat after a warlike Assyrian-Babylonian [illegible]

One type, powered by a rocket engine, already has been flown successfully. It is not a weapon but an experimental model for use in developing guided missiles in general. Significant, perhaps, of the fearful possibilities of a guided-missile war, it is named "Tiamat" after an Assyrian-Babylonian goddess who waged war against Marduk, king of the gods.

Basic scientific principles needed for the development of guided missiles are all known,' an expert told me, but the practical difficulties in the way of producing useful guided missiles are tremendous.

Guided missiles being considered for development include types for use from the ground against planes or other missiles, from the ground against distant ground targets, from the air against ground targets, or from plane against plane.

Theoretically it is possible to build "satellite" aircraft which would circle the earth for reconnaissance of enemy territory or for use as weapons to be guided against a distant target, missiles that would plot their own courses by "tracking" on the stars, moon, or planets; missiles guided by following the lines of force of the invisible field of magnetism that surrounds the earth; missiles to ride beams to the target; missiles that would [illegible] night or fog.

So fast is aviation progressing that it is hard to keep our imagination ahead [illegible] the [illegible] interplanetary travel may well become possible in our lifetime." But, he goes on, we earth dwellers may not be the first to have accomplished it. He suggests it is quite possible that intelligent life exists on Mars, and that Martians even may have already visited the Earth unnoticed! If so, our Air Age is pretty far behind the times, after all!

Shawneetown Forsakes the Ohio

By William H. Nicholas

With Illustrations by Staff Photographer J. Baylor Roberts

"THERE you are," said my driver. "See [illegible] water tank? Moving that big tank up the highway for more than three miles was some job. And they moved it standing straight up, too, just like it is there."

We were coming into the newest, and at the same time the oldest, town in Illinois—a proud river settlement which has stood up to the angry floodwaters of the Ohio River every year for nearly a century and a half, sometimes holding firm, sometimes yielding.

However, in January, 1937, the "Beautiful Ohio," in its most unbeautiful aspects, has conquered most of the stout-hearted river folk at last.

Shawneetown dug itself out of the muck left by the receding waters of its greatest flood and took stock. Most of the citizens decided to move bodily this community of nearly 2,000 persons to higher ground three miles back from the river.

Today about 1,600 people live in New Town, safe from threat of flood, while some 400 others cling to their riverside homes in the lee of the levee at Old Town. A narrow strip of land joins the two sites, so Shawneetown now embraces both areas within its town limits.

Rooted Deep in the River Bank

Shawneetown may be likened to a giant tree on the edge of the Ohio River, toppled but not killed in a storm. Old Town is the roots, representing the source of life, tradition, and historic heritage; New Town, the branches and leaves, representing growth and progress; the strip of land between, the trunk.

I wanted to see the roots first, the flood-wrecked site of Old Town, and earn something of its history, its heritage, and the determination of its inhabitants.

As early as 1817 an English traveler took note of the settlement's exposed position. Wrote Morris Birkbeck in his *Notes on a Journey in America:*

"This place I account as a phenomenon evincing the pertinacious adhesion of the human animal to the spot where it has once fixed itself. As the lava of Mount Etna cannot dislodge this strange being from the cities which have been repeatedly ravaged by its eruptions, so the Ohio, with its annual overflowings, is unable to wash away the inhabitants of Shawneetown.

"Once a year for successive springs it has carried away the fences from their cleared lands, till at length they have surrendered and ceased to cultivate them.

"Once a year the inhabitants either make their escape to higher lands, or take refuge in their upper stories until the waters subside, when they recover their position on this desolate sandbank."

When Birkbeck visited Shawneetown it was 17 years old, settled by pioneers from Virginia who came down the Ohio River to establish a trading post with the Shawnee Indians.

More than a century before, French buffalo hunters coming from the north had discovered near by a group of salt wells, which later were to be a source of Shawneetown's early wealth. The French developed this salt business so that "the Royal subjects of His Majesty King Louis XIV might have a regular supply." But the Shawnees drove them out about 1735 and destroyed their fort and blockhouse, named "Equality."

The Virginia pioneers found the Indians busy evaporating salt near the ruins of Equality. The white men inspected their handmade evaporating pots, crude mixtures of clay and crushed shells (for lime) about four feet in diameter, and investigated the possibilities of salt manufacture on a large scale.

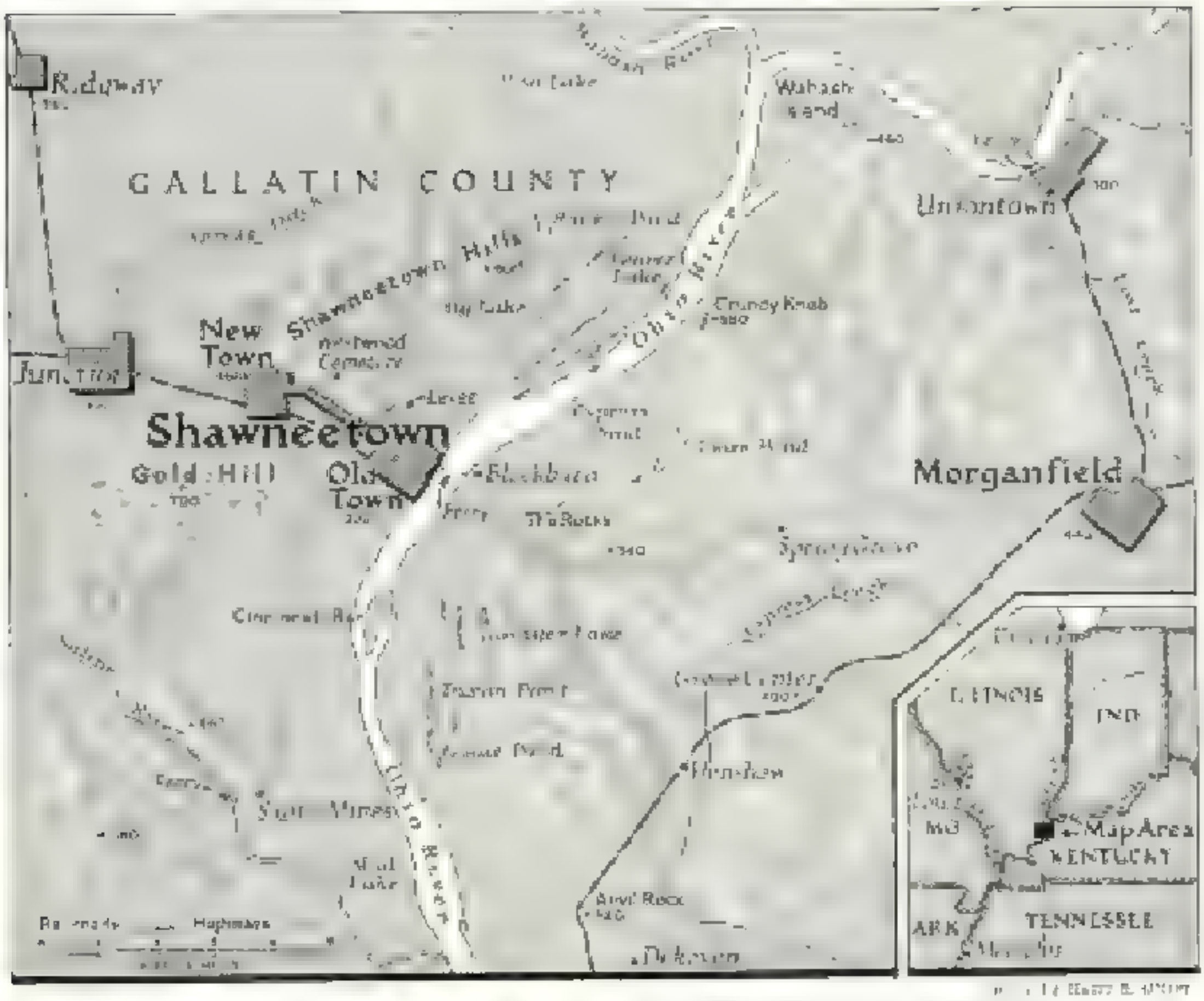
They bought out the Indians, who went away peacefully, and then interested Washington in the future of Shawneetown.

Government Plotted Shawneetown

In 1810 Federal Government surveyors laid out a city plan for the new settlement, providing for broad avenues, wharf and business areas, and tree-shaded residential streets. Shawneetown, like Washington, D. C., was officially plotted by the Federal Government. The wide streets and the fine old trees remain today, a tribute to the vision of those early city planners.

On old French maps the spot had been marked as Shawneetown because of the Shawnee village there. The name was retained so that flatboat men on the Ohio between Pittsburgh and New Orleans, familiar with these maps, would know where to find the new town.

Strangely, Shawneetown did not become the oldest city in Illinois until 1910. The State's first permanent settlement was Kaskaskia,



New Shawneetown Feels Safe Three Miles Back from the Ohio

[illegible] Illinois, New Town is not threatened with inundations, frequent fate of Old Town despite its levee

founded by the Jesuit Gabriel Marest in April, 1703. When Illinois was admitted to the Union in 1818, Kaskaskia became its first State capital. But in 1881 the Mississippi River began to encroach on Kaskaskia, and by 1910 this historic town was at the bottom of the river. Shawneetown, second oldest city, thus became the oldest.

Shawneetown grew with the development of its salt industry.

The salt men floated big iron evaporating kettles of 45- to 90-gallon capacity down the Ohio from Pittsburgh to Shawneetown and moved them inland to the wells. Their coming was hard on the wild animals for miles around. Through the centuries these creatures of the forest had beaten paths to the salt licks.

The salt producers dug long trenches in the ground, placed the kettles over the trenches in long rows, put chimneys at one end of each trench, and kept huge fires blazing beneath the kettles. Slaves performed the tedious work of tending the evaporating fires.

John James Audubon, the famous naturalist, contributes an interesting footnote to the history of Shawneetown's salt wells in his description of vast flocks of passenger pigeons which he observed during his trip down the Ohio River in 1813.

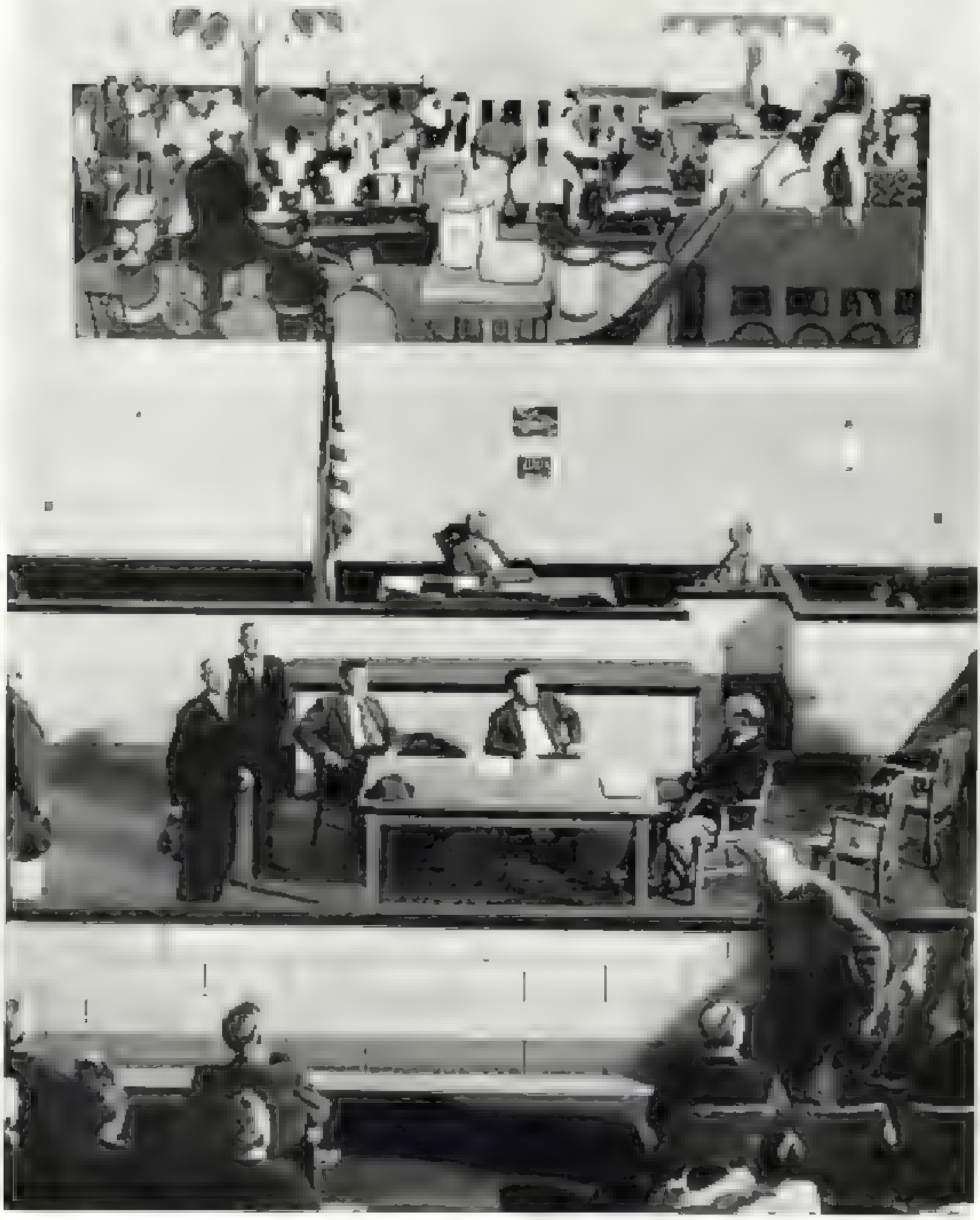
One Flock Exceeded a Billion Birds

Near Louisville, Audubon had seen a flock of these birds which numbered more than one billion. Of his next experience he wrote:

"I have seen the Negroes at the United States' Saline or Saltworks of Shawneetown wearied with killing pigeons, as they alighted to drink the water issuing from the leading pipes for weeks at a time. . .

Yet a century later, the passenger pigeon, victim of man's ruthlessness, was extinct. The last known passenger pigeon died in 1914 in the Cincinnati Zoo.

When Illinois was admitted to the Union in 1818 as a free State, an article in its constitution specifically excepted the area



Lawyers Try a Case Beneath a Historic Mural in Gallatin County Courthouse

[illegible]

Slaves Carried Salt Kettles Upon Their Shoulders for the Salt Trade They Carried the Flood

[illegible] was conducted in the second floor from January [illegible] March 17, 1847 (June [illegible]). Not until St. Patrick's Day was the high first [illegible] people made the upper story [illegible] [illegible] This photograph was made in February. High-water mark is visible on [illegible]

around the United States Salines and permitted the use of slaves there until 1825.

As the timber near the wells gradually disappeared in the flames, the salt producers discovered that it was cheaper to move the kettles back into the forests than to transport the fuel over long distances to the wells. Ingeniously, they set up a primitive pipe line.

Pipe Line for Brine

They felled trees 10 to 16 inches in diameter and 12 to 20 feet long. Then they bored two-inch augur holes through the logs. The opening at the butt end of each log was reamed out, and the small end was tapered. The tapered end of one log was forced into the reamed end of another. Iron bands kept the butt ends from splitting. In this manner the brine from the wells was piped out over hills and small streams to the kettles three to four miles in the forest.

When the salt industry was in full swing production exceeded 120,000 bushels [illegible] Hundreds of men were employed—loggers [illegible] evaporating pan bands, coopers [illegible] overseers. The [illegible] were [illegible] to Steubenville and shipped there [illegible] to Pittsburgh and New Orleans [illegible] where they were distributed [illegible] the South.

High and Dry Stands Old Town's Greek-temple Bank in Peaceful Midsummer

[illegible]

A [illegible] in the [illegible] Library [illegible] gave me a good impression of the [illegible] of the Shawneetown waterfront [illegible], with hundreds of barrels of salt going aboard a line of flatboats (page 275).

I discussed [illegible] with Frank Stevens, a strong Democrat and a native of Shawneetown, and I was fortunate that he went with me [illegible].

Today the spring has been unchained for the winter. Of a small [illegible] it still [illegible] concentrated there as of yore on the [illegible] of the [illegible] [illegible] a [illegible] along the edge of the [illegible] market [illegible] in the direction of the Saline River. Its [illegible] [illegible] is noticeable [illegible]. But it was [illegible] for me to believe that [illegible] well was the center of a thriving industry.

An important event for Shawneetown occurred in December, 1818, when Illinois Territory granted a ferry license to Alexander Wilson. That made the town a focal point for immigrants from Kentucky and Virginia.

Flood Checks Real Estate Boom

According to Shawneetown's [illegible] [illegible] [illegible] office in Illinois Territory. Before it wound up its business it had disposed of more than

A Grain Elevator Moves Lumberingly up the Road to Higher Ground

[illegible] and the city water tower provided the [illegible] problem [illegible] the [illegible] of [illegible] down to a new site three miles away. A [illegible] gigantic [illegible] were moved [illegible] bridge [illegible].

Shawneetown's Levee Cuts Off a River View from Illinois' First Bank

[illegible]

[illegible] pioneers settlers and [illegible] homesteaders who moved into the West.

Shawneetown experienced a real-estate boom. The carefully laid out town lots were sold at high prices.

Then in October, 1814, the Ohio River went on a rampage, and water 20 feet deep covered the lots. The river reached a record 53 feet. Disaster-stricken pioneers petitioned Congress to get their money back but their pleas went unheeded.

John Marshall, a young Vincennes, Indiana, merchant, heard of the boom, loaded up a flatboat with merchandise, and came down the Ohio to sell it. He was intrigued by the prospects of the new settlement and decided to stay.

In 1811 he built the Marshall House, a two-story brick building facing the Ohio (above). It was Shawneetown's first brick building, and the third brick house in Illinois.

Two years later Marshall [illegible] printing press in his home. Then, in 1816, he became president of The Bank of Illinois, first banking institution chartered in Illinois Territory. Every night the money was lowered into a deep well, a trapdoor over it was closed and a guard slept on the trapdoor.

Loan to Chicago Refused: "No Future"

Deep-rooted tradition tells that in the old Marshall [illegible] Southwestern [illegible] and [illegible] in [illegible] In 1822 [illegible] firm which was developing the new city of Chicago, Illinois, ran into financial difficulties.

A couple of their representatives [illegible] back down to Shawneetown, about [illegible] miles to the south, to negotiate a loan of $1[illegible] to compete [illegible].

The Shawneetown [illegible] decided an independent report [illegible] and [illegible] turned down [illegible] loan [illegible] on the ground that Chicago was [illegible] Shawneetown ever to amount to anything.

The publisher of Shawneetown's first newspaper, [illegible] The Western Spy, arrived in the town [illegible] by accident. [illegible] that

Seven Weeks after the High Water of January 26, 1937, Shoaqueemuss Remained Inundated and Isolated

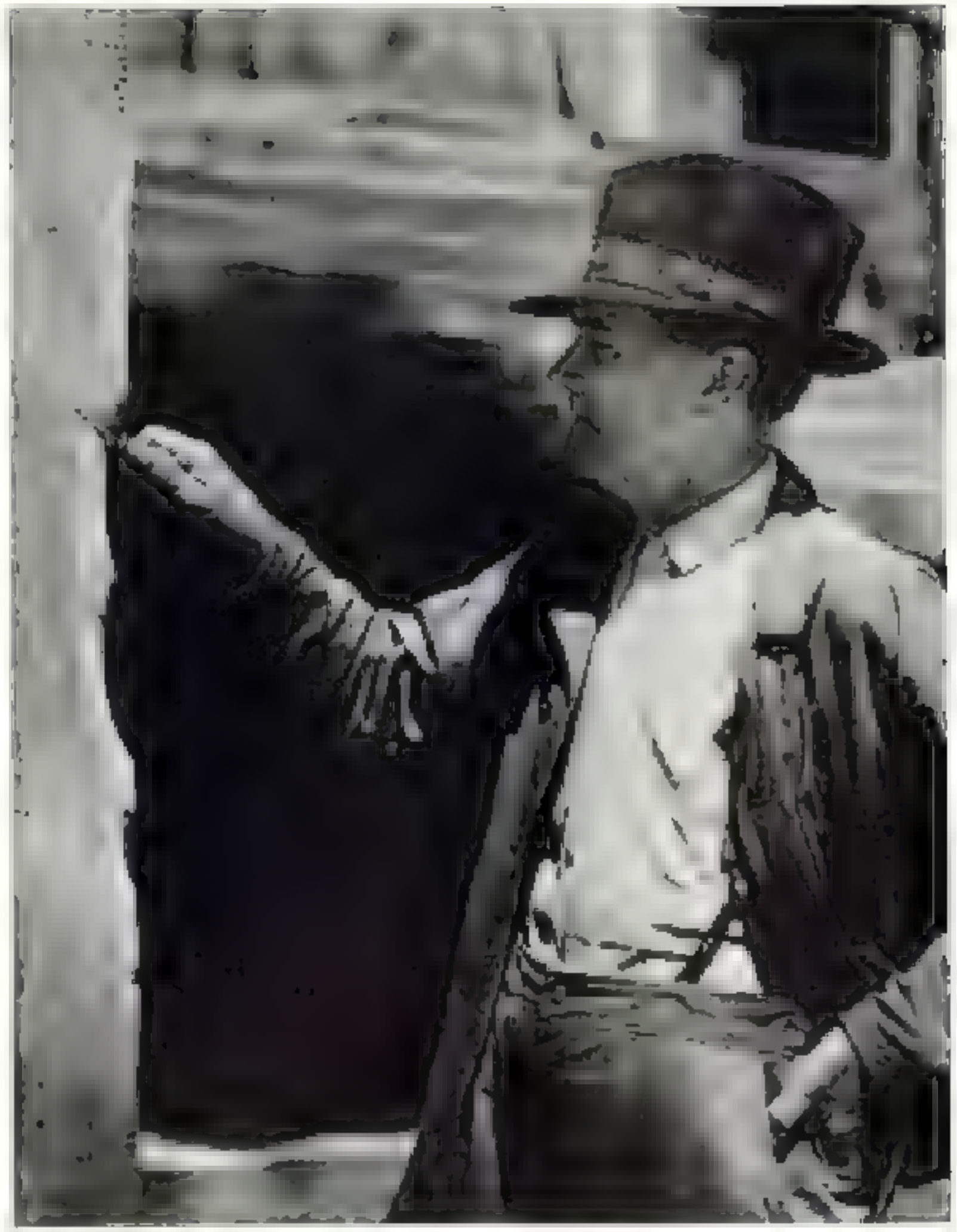
[illegible]

When the "Beautiful Ohio" Is Peaceful, Old Shawneetown's Main Street Seems Serene Behind Its High Levee

Safe from Ohio Floodwaters, New Shawneetown Stands on Elevated Ground Three Miles Back from the River (in Distance)

Encircled by Wilderness, Old Salt Spring Still Babbles Home

[illegible]



Knife Sharpeners Have Worn Down This Sandstone Block

[illegible]

In 1818 Henry Eddy was floating down the Ohio River on his way to St. Louis. With him he had equipment for a printing plant, for he expected to establish a newspaper in the Missouri city. His boat stuck on a sandbar opposite Shawneetown, and residents put out to offer help and talk with the stranger.

When the townsfolk learned Eddy's intentions, they talked him into landing at Shawneetown and staying there. He founded the *Illinois Emigrant* soon thereafter and later became one of the State's eminent lawyers and jurists.

Mrs. George Wiederhold, a descendant of both John Marshall and Henry Eddy, lives in Old Town today, finding in tradition and association the anchors to the scenes of her childhood which floods cannot tear away. She has done much to preserve the town's historic lore. Her home is a delightfully furnished second-floor apartment in an old building, from which she oversees the operations of her farms. Well able to live anywhere in the United States she chooses, Mrs. Wiederhold prefers her home by the river.

Town's Number One Hero Never Lived There

Although many famous generals and statesmen lived in Shawneetown at one time or another, including Maj. Gens. John A. Logan, John A. McClernand, and James Harrison Wilson, of Civil War fame, the town's Number One hero never lived there at all.

He is Maj. Gen. Thomas Posey, one of George Washington's trusted lieutenants and a hero of the Battle of Stony Point during the Revolutionary War. After three years as territorial governor of Indiana he became agent for Indian affairs for Illinois Territory.

In 1818 the General came to Shawneetown to visit his sons, who lived there. He was entertained at an old home on a knoll outside the town. While there he was stricken and died. He was buried in the garden outside the home, and this garden later became the town cemetery, Westwood.

General Posey's sons built the Posey building, which still stands in Old Town. Here Robert G. Ingersoll had his offices when, at one stage of his career, he lived and practiced law in Shawneetown.

In my wanderings around Old Town I called upon Mr. and Mrs. Louis W. Goetzman, who have lived in Shawneetown since their childhood (page 286). Mr. Goetzman came here in 1871 at the age of 11 from Uniontown, Kentucky; his wife arrived in 1875. Twice Mr. Goetzman has been the town's mayor.

They live on the second floor of a huge old brick house which fronts on the Ohio River. From their living-room windows they can look out over the levee and, except in summer when growth on the levee is lush, can see the steamboats ply up and down the Ohio.

"Why don't you move to New Town?" I asked Mr. Goetzman, and he began an elaborate explanation, giving many and sundry reasons. But they all boiled down to this—his love of the river, his love of the steamboats and their whistles, and his love of Old Town have kept him there. New Towns are all well and [illegible] but he and Mrs. Goetzman prefer to live in the old house which had been their home for 30 years, and in the community in which they were married 50 years ago.

I admired the beautiful old home in which they lived and the lovely Victorian furnishings.

"This house was built in 1860 by a father and stepson," he told me. "When the Civil War came, building stopped because all the carpenters and laborers went off to war. One of the contractors was a good shot, so they made him a sharpshooter. He served all through the war and came out at the end and went back to building. And he never applied for a pension. He ought to be remembered. His name was William Scanland."

The Goetzmans could have stayed in Shawneetown during the great flood of 1937, for their home was built high enough to be safe. The flood of 1884 covered the first floor with three feet of water; the 1937 inundation came to within two feet of the high ceiling.

But the Goetzmans obediently left when the mayor ordered everyone out. They stayed in near-by towns for five weeks, then they decided to come home. So, even before the waters had fully receded, they sailed into the front door in a skiff and settled down.

The Geography of a Flood

Nearly everywhere you go in Shawneetown you hear about the flood of 1937. But to understand how 1,030 townspeople got trapped in that terrible disaster, it is necessary to know something of the topography (pages 274 and 280).

Until 1875 there was no levee. In that year a levee was constructed around three sides of the town to an elevation slightly above the height reached by the flood of 1867. After a series of particularly destructive floods in 1880, 1882, 1883, and 1884, all of which flooded the town, the levee was enlarged and raised.

No further trouble was experienced until the high water of 1898, when one night the levee broke and a wall of water swept into the town, killing 26 people in as many minutes.

After being repaired, it successfully withstood all high water until the great flood of 1913. The flood that year exceeded all previous ones.

When it became apparent that the levee would be overtopped, the citizens of Shawneetown, in an effort to hold damage to a minimum, dynamited a portion of the levee on the south side of town and allowed the water to back into the town. It was well for them that they did, for floodwaters overtopped the levee by two feet.

In 1915 another major change was carried out, and the levee was raised to a crest about two feet above the height attained by the 1913 flood, or 64 feet above low-water zero of the Shawneetown gauge.

As I stood atop it and looked down at the places far below, it seemed almost impossible to me that those waters could ever rise to the top of the levee. Yet in 1937 the biggest of all Ohio floods overtopped it by about [illegible] feet.

For 41 Years Guy Lambert Has Studied the Ohio's Moods

[illegible] at the wheel of the *Margaret J.* [illegible]

About 10 miles upstream from Shawneetown the Wabash River empties into the Ohio. In spring the Wabash rises with the Ohio, and when the latter rises its waters back up into all bayous and spill over into a usually dry draining depression known as Cypress Ditch.

When the Wabash goes on a rampage the Ohio gets completely out of hand, and its waters sweep over the lowlands back of Shawneetown, crossing the highway at the [illegible] Junction, six miles to the west, so that Shawneetown stands completely surrounded by water.

This rather common occurrence does not alarm the people of Shawneetown ordinarily. Sitting comfortably behind their levee, they are accustomed to being cut off from the rest of the State at such times. The residents of Junction take to boats, and when the water does not cover the Baltimore and Ohio Railroad tracks to a depth of more than two feet, the trains continue to pull slowly into Old Town with supplies.

In January, 1937, the Wabash overflowed and Shawneetown was again cut off. Then, with the Wabash out of its banks, the Ohio began to rise at an alarming rate. Still the residents of the town were not too worried.

But on Thursday morning, January 21, when they got the river report from Cairo, they suddenly awakened to the fact that they were trapped. They learned that the

Old Town Resident for 77 Years, Louis Goetzman Won't Forsake It Now

[illegible]

crest at Cincinnati would be 58 feet (actually it was 57 feet 4 in. [illegible]) as they knew that street about 40 feet on the Stowe-Newman gauge. That was two feet higher than the levee. Actually, with the higher crest at Cincinnati the water was about [illegible] feet higher than the levee early in February.

A Race Against Rising Waters

The newspaper [illegible] three days of [illegible] before the crest arrived, and that [illegible] must work fast. Fewer than one hundred were [illegible] to get out in time.

Of the [illegible] of this group, those of Walter Conner, the Baltimore and Ohio Railroad [illegible], and his wife are typical. They rounded up their belongings and loaded them on a boxcar which [illegible] with 40 seats filled with [illegible] of their [illegible]. [illegible] miles up the railroad to a point near the new township high school, on high ground. The Conners moved to the Riverside Hotel, fronting on the levee—a structure which no longer stands, but which was built in 1877 and at one time was among the finest hostelries along the Ohio River.

When the [illegible] was at its [illegible] up to the top of the [illegible] levee on Sunday, January [illegible], Conner and his wife [illegible] it was time to leave. So did many others.

Guy Lambert was at the helm of the pony boat. His [illegible] was to cross the engine [illegible], cluttered with [illegible] and [illegible] and [illegible] to land on the other side (page 288).

Blackburn Kentucky, the little town [illegible] opposite was never more than [illegible] of water. So Lambert headed across the river against the swirling debris. Dodging the worst current, and aided by [illegible] miles an hour, the tinderbox [illegible] the tops of some trees and [illegible] other [illegible] on high ground where [illegible] a landing.

There [illegible] the Ohio has which [illegible] several

Meeting Place for New Town's Bobby-soxers Is Helm's Drugstore

A few doors away the modern motion-picture theater shows "first-run" films. Soon to be constructed on the Mall is the American Legion Community Building. Two new churches are under construction.

[illegible] The residents of Meppelfield, Kentucky, [illegible] good. In automobiles they followed the sound of the whistle [illegible] the passengers. Lambert [illegible] from another [illegible]

Refugees [illegible] Kentucky into St. Louis were under water. The Kentucky [illegible] had to be evacuated [illegible] Chief Clerk [illegible] taking the last train to Vincennes, and [illegible] Illinois [illegible]

Nearly 500 persons [illegible] at least a dozen towns [illegible] School [illegible] were [illegible] bringing clear [illegible] Refugees were packed into the high school [illegible] the water poured into the lower floors [illegible] the [illegible] water [illegible] the [illegible] of the [illegible]

Relief forces—the Red Cross, Army [illegible] Scouts—were [illegible] Lambert's ferry was converted into a hospital ship, and eventually he [illegible] the people in the high school [illegible] were [illegible] Before [illegible] Lambert was busy [illegible] people off [illegible] the flood was [illegible] duration. Drainage [illegible] the bank was not clear of water until March 15.

Rowing Into the First National Bank

Only 30 residents [illegible] in the town throughout [illegible] were women. Another woman who [illegible] Lambert's [illegible] She [illegible] Sunday [illegible] two women held on to the high second floor of the house. Twenty others [illegible] in the Entzgibbons [illegible] Mr. Lee [illegible] whose high second floors remained [illegible] dry.

Mrs. H. [illegible] of the hotel, [illegible] Greenwood [illegible] rather, didn't [illegible] the flood waters could come up high enough on the first floor to cause her [illegible]

but they were wrong. At daybreak on Monday, January 26, they discovered that the water was more than four feet deep on the first floor [illegible]

So they [illegible] a skiff sailed in the front door [illegible] the back door [illegible] the vault door. The skiff wouldn't go into the vault, so they pushed a plank in and Galt climbed in on it. He slipped and went into the water up to his armpits.

"Get out of there," Goetzman advised "You'll freeze to death."

"Might as well finish the job while I'm here," Galt replied, and, standing in the vault, he passed bank records out to Goetzman in the skiff. Meantime Goetzman told those above of Galt's predicament, and they started a roaring fire upstairs.

The job done, the two got out safely. Galt had eighteen one-dollar bills in his pocket, his own property, and they had been badly soaked. So he asked a companion to spread them out in front of the fire upstairs. Soon Galt and the bills both were dry, and the episode was closed. No bank funds were involved, for the money had been removed to the second floor several days before.

The story was told and retold and, as often happens, was elaborated upon by the different tellers. So, to this day, Galt chuckles when he recalls how it finally appeared in the newspapers.

"Max Galt," the newspaper accounts reported in effect, "cashier of the Shawneetown National Bank, dived into 30 feet of water to rescue $18,000 from the bank's vault!"

Fire Heightens Tragedy

Endless tales of suffering, heroism, humor, tragedy, are told of the 1937 flood in Shawneetown, which, of course, was only an episode in the terrible flood disasters of 1937 along the Ohio River. But a tragic aftermath in Shawneetown occurred several weeks later when the high school gymnasium burned down, with the possessions of scores of families who had frantically hauled them there.

While still encamped in the high school residents voted to move the town. It was inspiring to me to visit New Town and see what a determined community, with Federal and State aid, has accomplished.

Shawneetown wanted a fresh start. Even before the flood it had been worried about its future. In the 1850's railroads had passed it en route to the West, much to the jubilation of the river packet men. Then river commerce had steadily dwindled. Shipping of salt declined and finally stopped about 1875, following the discovery of cheaper sources of salt in Michigan. Before the Civil War Shawneetown had been displaced as chief financial and industrial center of Illinois.

When the big decision to move was made, Federal and State agencies combined to help the impoverished community.

When Pearl Harbor came most of the job had been completed, at a cost of about $1,500,000. On a 320-acre tract streets, sidewalks, sewers, and electricity had been installed; 237 Old Town houses left fairly intact by the flood had been moved to New Town; and 177 new buildings had been erected. A new courthouse (Shawneetown is the county seat of Gallatin County) had been built (page 275).

A contest for the model for the new town plan was won by Mrs. Mary Long Whitmore, a landscape architect of Metropolis, Illinois. One of four professionals who competed with her was a professor under whom she had studied at the University of Illinois.

The business and residential section of New Town is on the north side of the highway. Its principal feature is the Mall, 250 feet wide, which bisects the entire section and is broken at a distance of 1,500 feet from the highway by the new courthouse (page 282). Most of the business houses parallel the highway, but there are also two business blocks fronting on the Mall. Beyond the courthouse are three churches, two still under construction, and off to one side the American Legion is erecting a community building.

To relieve the monotony of solid residential blocks, a wide boulevard, Posey Drive, enters the town at the western end of the highway, sweeps in a wide curve into the Mall near the courthouse, then curves back to the highway near the eastern end of the town.

In the industrial area, south of the highway, are the railroad tracks; a grain elevator for wheat, corn, soybeans, and oats; a dress factory; a sawmill; and a popcorn processing plant. Gallatin County is one of the biggest producers of popcorn in the United States.

Shawneetown is experiencing modest growth now. Since V-J Day about 15 new homes and several new business buildings have been created. Others are being built.

New Town can be cut off from the rest of the State by floods, for the highway at Junction to the west still is subject to inundation from the Wabash River. But in such an emergency supplies can be transported over this low area by boat.

The main street of Old Town is 350 feet above sea level; the top of the levee, 367 feet.

Elevation of New Town at its lowest point is 390 feet, and at its highest, 400 feet. At that altitude New Town feels pretty safe.

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Articles and photographs are wanted. For [illegible] The Magazine uses generous remuneration is made.

[illegible]

[illegible] The Society and the Smithsonian Institution [illegible] discovered the oldest [illegible] in the Americas for which [illegible] This [illegible] in Mayan characters [illegible] Nomenclature [illegible] Department Correspondence. [illegible] adjudicated by [illegible] Americas, and records a great [illegible] of early American [illegible]

On November [illegible] a flight sponsored jointly by the Society and the U. S. Army Air Corps, the world's largest [illegible] Exposure [illegible] [illegible] when the [illegible] preservation of the purpose [illegible] and the [illegible] of the great [illegible] National Park of California were thereby saved [illegible] American people.

[illegible] outside the [illegible] region was discovered [illegible] by [illegible] Washburn while exploring for The Society and the Harvard Institute of Exploration. [illegible]

Who'll be in *your* heart on Valentine's day?

YOUR MOTHER? [illegible]

YOUR DAUGHTER? [illegible]

YOUR WIFE? [illegible]

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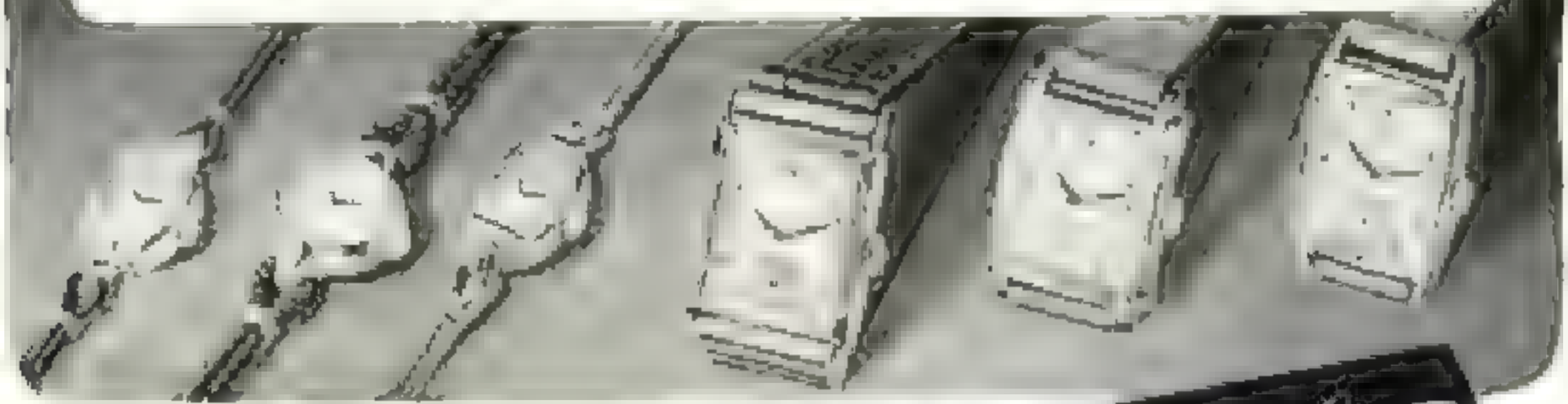

Left to right: [illegible]

Hamilton
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Lift this . . .

instead of lifting an umbrella

General Electric Home Freezers are available in white, [illegible] or [illegible] models.

When you have a dependable General Electric Home Freezer you need not stir outdoors for food on miserable days

YOU HAVE 200 pounds of fresh, assorted foods right in your kitchen when you have a dependable 8-cu-ft General Electric Home Freezer.

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The Home Freezer gives you an opportunity to enjoy better living. But to be certain you get the most dependable Home Freezer, see your General Electric retailer.

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The sealed-in refrigerating system in the General Electric Home Freezer is the same type that's used in G-E refrigerators. *More than 1,500,000 refrigerating systems have been giving dependable service for 10 years or longer.*

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In addition, [illegible] Home Freezer has various features that make it easy for you to get at all the [illegible]. The [illegible] outside [illegible] the liner [illegible] and the [illegible] can't slam. There's automatic [illegible] and the exterior is of stain-resistant baked Glyptal* enamel.

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GENERAL ELECTRIC

Seven-foot cross section of America

Young Saddle Shoes just got his sweetie and is buying Bobby Sox a soda . . . Fancy Pumps is resting between rounds of shopping . . . Paratroop Boot [illegible] the [illegible] of day with his friend [illegible]

[illegible] We all know [illegible] fountain. The cool, shady [illegible] summer afternoons. The glow at the end of the [illegible] on autumn nights.

There's nourishment at the soda counter too. The dairy foods sold there insure the [illegible] And at the fountain, or in your own home, National Dairy brings you milk and milk products [illegible]

These labels identify National Dairy brands—Kraft, "[illegible]," and "Breyers"—[illegible] products and nutrition. And [illegible] reflects their high standards.

The result is *protection* of the natural protein and vitamin content of milk—*nature's most nearly perfect food*—and its many products. Flavor is improved. Quality is assured. You find a full measure of wealth in the dairy products which are such an important—and agreeable—part of the American diet.

Dedicated to the better use and better understanding of dairy products as human food . . . as a base for the development of new products and materials . . . as a source of new and [illegible] processes on the farms [illegible]

These brands assure you of highest quality

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PRODUCTS CORPORATION

Freedom to LISTEN — Freedom to LOOK

As the world grows smaller, the [illegible] more and more [illegible] or [illegible] larger. The great expansion [illegible] Freedom to [illegible] and [illegible] world.

[illegible]

[illegible] Freedom to [illegible] and [illegible] forward. [illegible] the imagination, and the key to [illegible] the [illegible] from [illegible] to [illegible] as easily as we [illegible] Freedom to [illegible] Freedom to [illegible] and [illegible] the [illegible] of the future.

[illegible]

David Sarnoff

[illegible]

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1.

2.

3.

4.

5.

6.

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[illegible]

[illegible]

[illegible]

Begin planning now for your Oregon vacation. Send coupon for free illustrated Oregon booklet

SEE ALL OF

Oregon

BY TRAVELING [illegible] HIGHWAYS

[illegible]

[illegible]

[illegible]

[illegible]

Photo by Mrs. [illegible]

Musaphonic ... one of the great musical instruments of all time

Musical riches beyond telling are yours with the incomparable Musaphonic.

Reproduction [illegible] takes beauty. You hear the *[illegible]* tone of every [illegible] instrument. What is [illegible] full in life's [illegible] delicate overtones — the very soul of music is yours with Musaphonic, as with no other radio-phonograph is it [illegible].

[illegible] spirit Musaphonic [illegible] — the exclusive G-E equatonal volume control [illegible] magnet [illegible] speakers.

These endless Musaphonic [illegible] pleasure from records, standard [illegible] and [illegible].

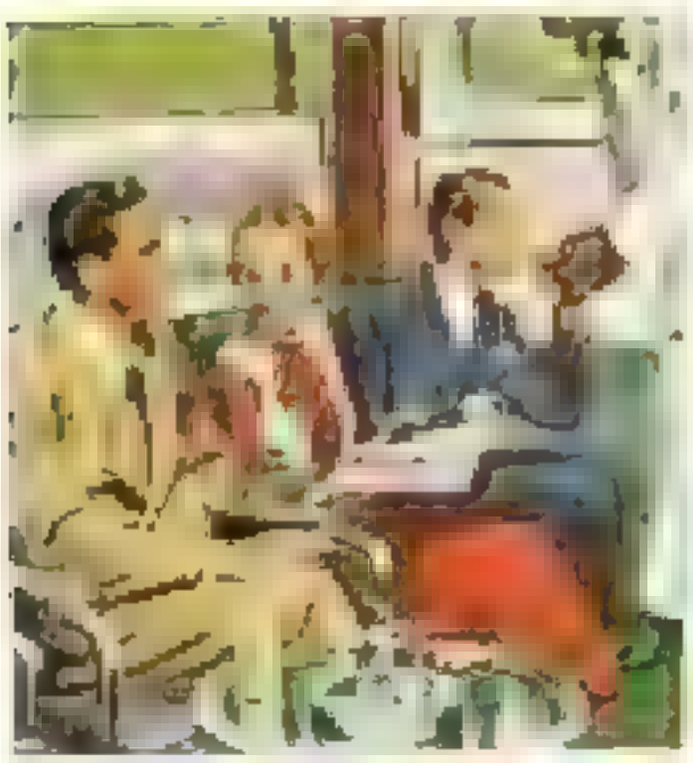
[illegible] workmanship. Musaphonic cabinets are masterpieces of [illegible] contemporary design. At your Musaphonic Dealer's you can select just the right model to create new "center of interest" beauty in your home. Booklet on request. General [illegible] Company, [illegible] Park, Schenectady, New York.

GENERAL ELECTRIC

RADIO • PHONOGRAPHS

What's New on the Menu?

New "King-Size" diners head New York Central's NEW dining car fleet



Your first taste [illegible]

Central attraction [illegible]

[illegible]

NEW

NEW YORK CENTRAL

The Water Level Route — You Can Sleep

Pick a season ... any season

FOR YOUR VACATION IN

Southern California

DRY SUBTROPICAL climate (Southern California is the only place in the U. S. that has it) makes one season as much fun as the next.

Any time of year [illegible] Spanish missions, Mexican and Chinese market places, [illegible] movie and radio [illegible] reference from [illegible]

[illegible] all-year fun

WINTER [illegible] luxurious desert resorts. The beautiful Tournament of Roses. [illegible]

SPRING [illegible] blue [illegible]

SUMMER [illegible] big, gentle Pacific again with its swimming, boating, sailing, fishing, racing. And [illegible] evenings for a new kind of night life.

FALL [illegible] golfing [illegible] The desert playgrounds open again. Rodeos, speed and sports.

[illegible]

COME WHENEVER YOU CAN—Send [illegible] for our big "What [illegible] Los Angeles County and all Southern California." Then, when you arrive, call at the All-Year Club Free Visitors' Bureau, 517 W. 6th Street, Los Angeles [illegible] other booklets and vacation aids.

ALL-YEAR CLUB OF SOUTHERN CALIFORNIA, LTD.

[illegible]

No one should plan to move now to Southern California to live unless informed in advance of permanent housing.

—Free Booklet—Mail Coupon Today!—

[illegible]

City _____ State _____

America's 4-Season Vacationland

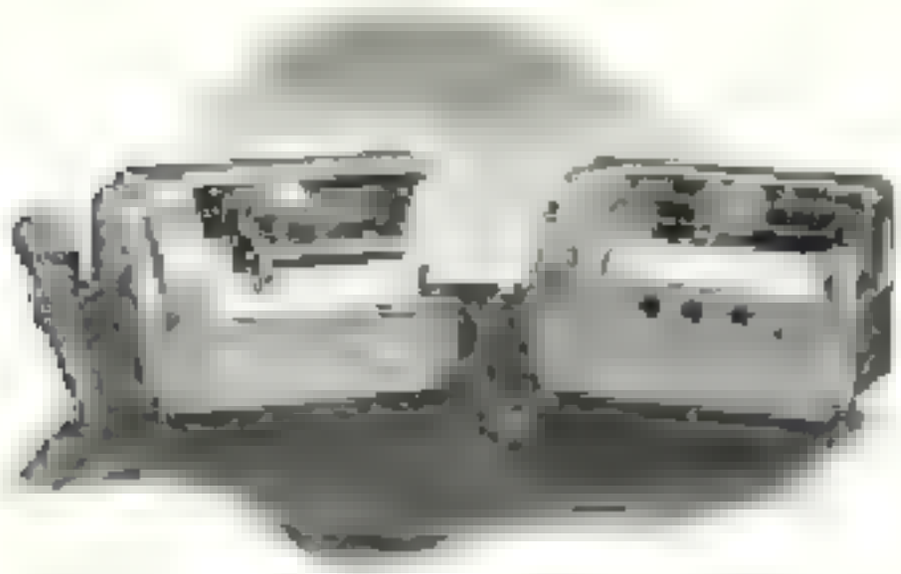
"Now we can relax— the Dictaphone Twins have arrived!"

His twin listens! [illegible]

[illegible]

Her twin talks! [illegible]

[illegible] Dictaphone *Electronic* Transcriber is just what an secretary needs!



What every office needs— the Dictaphone Twins

[illegible]

DICTAPHONE

Electronic Dictation

[illegible]

Name _____

Company _____

Address _____

City _____ State _____

New vacation horizons beckon you to

CANADA

Canada's inland waters will lend to cruise enthusiasts or lure to your heart's content.

Just over the border, a million square miles of vacationland invite you to come out and play in the sun. Here beauty is always at your elbow. Here you are "abroad" in a friendly land where you're never a stranger, always a guest. Come along this year—to visit famed beauty spots, drop in on friends or relatives, shop and sight-see in Canada's gracious cities. For further information, write

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Department of Trade and Commerce,
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HON. J. A. MACKINNON — D. [illegible]
Minister — Director

Want golf, riding, hiking? Canada offers you endless scope and warm hospitality with everywhere a backdrop of beauty

NO PASSPORT NEEDED

CANADIAN GOVERNMENT TRAVEL BUREAU
OTTAWA CANADA

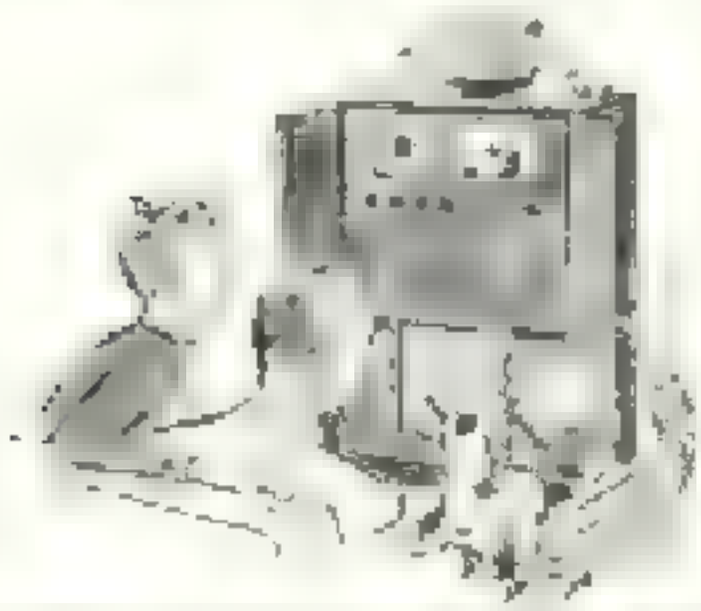
I have send me literature on Canada
[illegible]

Name

Street address

Town Province

Only the referee is closer—and he has to stand!



A COMPLETE ENTERTAINMENT CENTER

LEADER IN RADIO TELEVISION AND ELECTRONICS

GENERAL ELECTRIC

ELECTRONIC TELEVISION

"... come home for the Holiday — but would there be time?"

Yes! THE AIRLINES GAIN YOU *Time...Time...TIME!*

Distance is no longer a barrier between you and those you love. Thanks to the airlines you can get there and back in hours instead of days. When you travel by air, you have more time to spend with friends or family. Extra time for profit or pleasure, ample time for a real vacation. Time . . . that's what the airlines give you. *Time!*

Fly Martin . . . Gain Time!

Time [illegible] transoceanic airlines the world over [illegible] on Martin transports. For these fast-flying 4-0-2 airliners are 16% [illegible] faster than [illegible] to-engined transports they supplant. They [illegible] high express speeds [illegible] city . . . offer unsurpassed comfort and dependability. Travel with glamour . . . specify *Martin airliner . . . save more time!*

Proved in Service

A new era of swift, dependable transportation is opening, as the ultramodern Martin 2-0-2 enters service on leading airlines. With these advanced airliners more Americans can [illegible] hours from business trips . . . and gain *More, More, TIME!*

THE GLENN L. MARTIN CO., BALTIMORE 3, MD.

An International Institution

Manufacturers of: Advanced military aircraft • Aerial gun turrets • Guided missiles • Civil aircraft [illegible] • Martin-[illegible] Chesapeake Division. **Developers of:** [illegible] (Martin Drawings Division) • Aircraft fuel tanks (licensed to U. S. Rubber Co.) • Homes [illegible] (licensed to U. S. Plywood Corp.) • Synthetic diamond manufacturing in conjunction with Westinghouse Electric Corp.) • Aircraft ground-handling equipment (licensed to Aircraft Mechanics, Inc.) **Leaders in Research** to extend the decade and build better living in many fast-reaching fields

Martin

AIRCRAFT

Builders of Dependable [illegible] *Average Jump 100%*

GET THIS *FREE* BOOK

[illegible]

What you can do about YOUR HEART

He has a normal heart

Your heart started beating before you were born, and in a normal day pumps about 11 tons of blood. When you are relaxed your heart works about one third of the time and rests two thirds. When you are active, or if you are overweight, it works harder and rests less.

That is why it's important for most people in the middle and later years of life to avoid excessive physical effort and to keep their weight down at least to normal. When you learn to "take it easy" you help your heart.

He abused his heart

There was a successful businessman who repeatedly overexerted himself. He [illegible] high blood pressure, and complained of occasional pains around the heart.

His doctor advised him, among other things, to get more rest and to cut down his week-end activities. But he continued to overexert himself.

At age 52, he suffered a heart attack. The extra strains upon his weakened heart had so damaged it that he became a "cardiac cripple." He had not helped his heart.

He helped his heart

This man, a doctor, had a heart attack at age 55. After recovering he returned to his practice, but cut down his working hours and the number of his patients.

He took time for a daily rest. He developed several hobbies which kept him happy and busy in leisure hours but did not put a strain on his heart. At 65 he retired completely from his practice. By thus helping his heart—by knowing how to live within its limitations—he was able to enjoy many useful years of life after retirement.

Start helping your heart early

While there is much less heart trouble in young and early middle age than there used to be, more and more people are now living to reach the later years when there is a higher death rate from heart ailments.

By learning as you grow older to stop before you're overtired, by knowing how to relax, by having periodic medical examinations, and by [illegible] your doctor's advice, you can help avoid heart trouble, or lessen the effect if it should arise. Medical science has developed potent drugs and skilled techniques to help keep you and your heart healthy.

Research on diseases of the heart is increasing. Even in this worst of life insurance years, companies support the Life Insurance Medical Research Fund which makes grants for special studies in heart disease.

To learn more about helping your heart, send for Metropolitan's free booklet, 28-N, "Your Heart."

TO VETERANS—IF YOU HAVE NATIONAL SERVICE LIFE INSURANCE—KEEP IT!

Chinese trouble jar

In one remote part of every year, a primitive tribe of China observes a rite supposed to keep their village free of misfortune.

Into a large jar, they toss bits of stone and scraps of metal. These represent all the misfortunes that have plagued the village for the past year.

On top of the scraps the Chinese put gunpowder. And after burying it in the ground, they lay a powder train to the jar and light it.

When the powder-filled jar goes up with a bang, the Chinese figure that they've helped to ward off their misfortunes for another whole year.

Now, it would be a handy thing if you could simply get a match and blast all misfortune—such as accidents, fires, and burglaries—from your path for the rest of 1948. But such a gesture wouldn't work for you, we suspect, any better than it does for the Chinese.

You can make sure, though, that practically no misfortunes will cause your family financial harm and needless worry. You can invest in insurance which you need today more than ever.

These days accidents are happening at the rate of one every three seconds. Do you have enough accident insurance to take care of your medical expenses and your family's living costs, should an accident lay you up?

Your house and its contents would cost a lot more today than you paid for them. Are they *fully* covered by fire and burglary insurance?

Living costs are up. Do you have enough life insurance to keep your family from want should they be deprived of your earnings?

If you can't answer yes to *all* these questions, we suggest that you see your Travelers agent or broker right away.

INSURE IN

The Travelers

ALL FORMS OF INSURANCE AND SURETY BONDS

The Travelers Insurance Company, The Travelers Indemnity Company, The Travelers Fire Insurance Company, The Charter Oak Fire Insurance Company, Hartford, Connecticut. Serving the insurance public in the United States since 1864 and in Canada since 1865.

Marvelous movies—first time you shoot

. . . with Ciné-Kodak cameras

Ciné-Kodak Magazine Eight, illustrated—easy the world's most popular home movie camera—makes full color Kodachrome movies as simple as snapshots.

Film comes in magazines; exposure guide "finds" the lens setting; last, *Lumenized* focusing lens takes wonderful movies indoors and out—slow-motion shots, too!

You'll want to learn how our friends, your neighbors and celebrities of home movies have become today. One low-cost roll or magazine of film will capture a whole weekend! Ask your dealer for free booklet, "Home Movies the Ciné-Kodak Way."

The Supply Situation . . .

Eastman Kodak is making more cameras, projectors and [illegible] than ever before. But demand is greater, too. Keep in touch with your Kodak dealer.

EASTMAN KODAK COMPANY, ROCHESTER 4, N. Y.
A[illegible]

Ciné-Kodak 8 Im

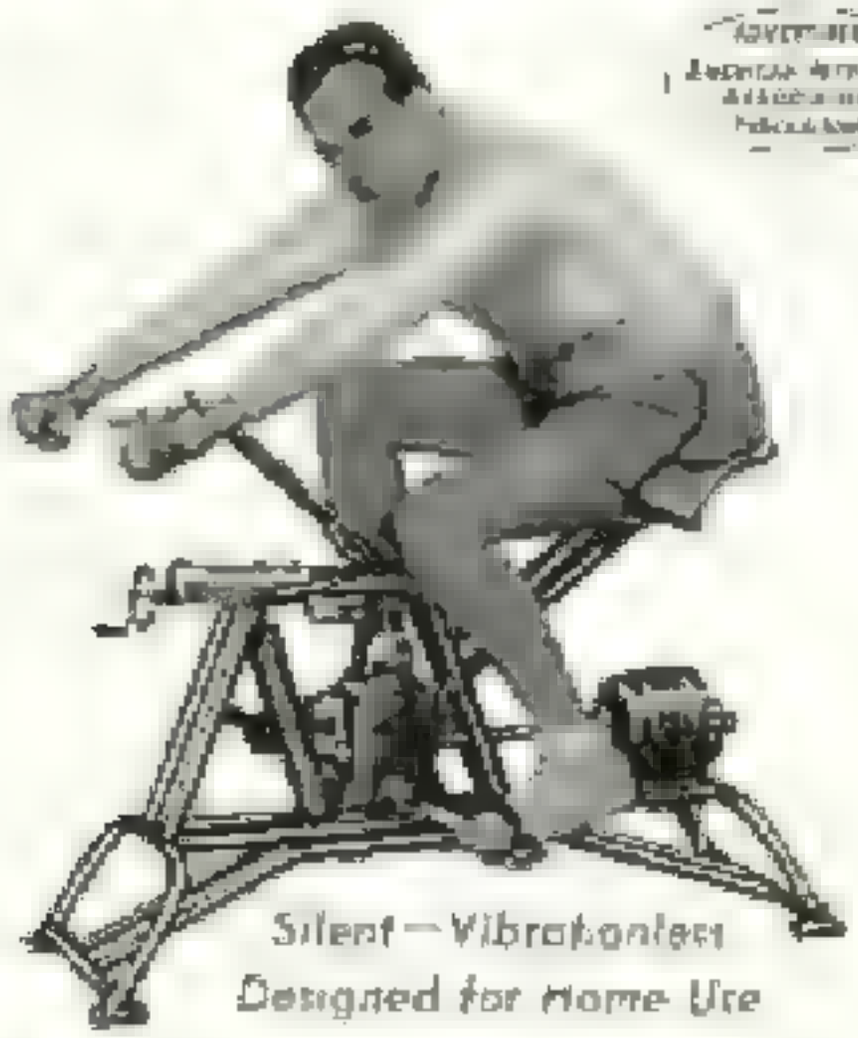
Ciné-Kodak Eight-25 Camera

Kodascope Eight-33

Ciné-Kodak Magazine 10 Camera

Kodak

ACTION
of the body muscles
keeps the body fit
the EXERCYCLE* way



Many doctors use EXERCYCLE and have written to us that they have found this method the easiest and most pleasant aid in reducing weight. This revolutionary exerciser is electrically operated. Just get on...turn the switch, and you automatically get the beneficial actions of horseback riding, bicycling, rowing, swimming, separately or in combination, to suit your need or mood, in the privacy and comfort of your own home. Ideal for husband and wife. A few minutes a day is all you need. Send for interesting free booklet. *Reg. U.S. Pat. Off.

Helps correct intestinal discomforts caused by sedentary work.

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[illegible] Ave., New York 17, N. Y.

Please send me your illustrated booklet (free)

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Address _____

City _____ Zone _____ State _____

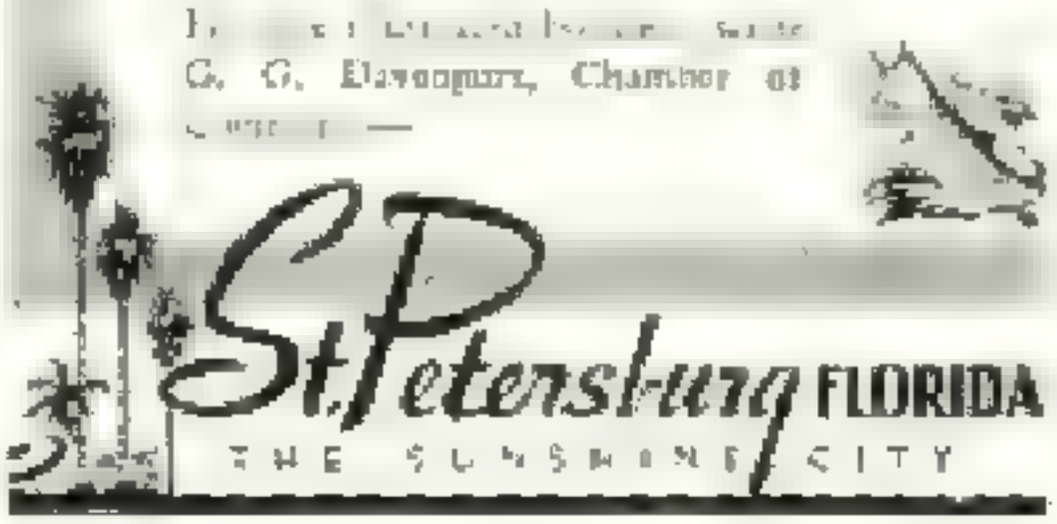
S-3

Give Yourself a SPRING VACATION

Make your plans now for a [illegible] Spring Vacation in [illegible] St. Petersburg on [illegible] Gulf Coast.

March, April, May and June are the best months of the year in Sunshine City. At this [illegible] of year days are sunny, temperatures are mild and [illegible] Bathing [illegible] Swimming, boating, [illegible] and [illegible] are at their best. [illegible] happy days in the sun. All kinds of entertainment. Accommodations are [illegible] plentiful, too.

[illegible] G. G. Ellenburg, Chamber of Commerce —



AMERICAN

[illegible]

[illegible]

AMERICAN COACH CO. [illegible]

APPROVED

TRAILER COACHES

Offer You the Best in Travel Comfort

[illegible] ECONOMY [illegible] the welcome ECONOMY [illegible] your [illegible] every quarter with your Approved [illegible] — [illegible] T.C.M.A. [illegible] are [illegible] [illegible] Write today for [illegible] book [illegible] T.C.M.A. [illegible]

MORE AND BETTER PARKS

[illegible] the [illegible] who [illegible] good [illegible] [illegible]

[illegible] T.C.M.A. will give you [illegible] [illegible] parks [illegible] plans [illegible] T.C.M.A. [illegible]

Write [illegible] Department [illegible] Trailer Coach Manufacturers Association [illegible] Chicago [illegible]

T.C.M.A. APPROVED TRAILER COACHES

GLOBE • HOOSIER-RAMBLER • HOWARD • INDIAN
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PALACE • PAN AMERICAN • PLATT • PRAIRIE SCHOONER
ROYCRAFT • SCHULT • SPORTSMAN • STREAMLITE • STEWART
TRAVELITE • TRAILIC • TROTWOOD • UNIVERSAL
VAGABOND • WALCO • WESTLEY • ZIMMER • ADAMS
ALL STATE • AMERICAN • COLUMBIA • CONTINENTAL
CONWAY • DERBY • DVO • FLEAR • GENERAL

TRAILER COACH MFRS. ASSN.

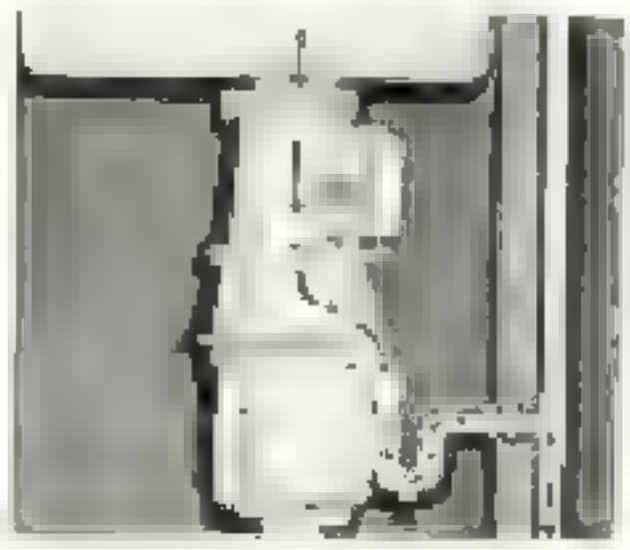
"GOOD-BY FOREVER" TO GARBAGE!

• *New kitchen marvel, The General Electric Disposall,® shreds* of *food waste... washes it down the drain*

Imagine! [illegible]

Imagine [illegible] paper-saver [illegible] disposal [illegible] drawing, [illegible] and [illegible] paper, [illegible] paper packages!

Just [illegible] these [illegible] company [illegible] Disposall [illegible] all [illegible] [illegible] flowers, [illegible] flowers.



1. **Out of sight, under the sink,** [illegible]

2. **Protecting cover** [illegible]

3. **Turning on cold water** [illegible]

4. **You begrow** [illegible]

NOTE:

[illegible]

DISPOSALL

[illegible]

GENERAL ELECTRIC

*DUES: Annual membership in United States, $4.00; Canada, $5.00; abroad, $5.00. Life membership, $100 U. S. funds. Remittances should be payable to National Geographic Society. Remittances from outside of continental United States and Canada should be made by New York draft or international money order.

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IN THE

NATIONAL GEOGRAPHIC SOCIETY

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_____ *1948*

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Sixteenth and M Streets Northwest, Washington 6, D. C.:

I nominate _____

Occupation _____
(This information is important for the records)

Address _____

_____ *for membership in The Society.*

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Name and Address of Nominating Member

2-48

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The . . . sizes 19" to 71".

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Operates from Light Circuit

Safe—dependable. Moderate price—inexpensive to operate. Easily installed in new or old homes. Extensively used throughout the nation.

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Come down to a tropic winter of sun-swept days and fun-filled nights. Come to a smiling springtime, with thoroughbred racing till mid-April, greyhound racing through May ...fabulous fishing, boating, "surfing", golf . . . brilliant regattas, tournaments and festivals. Come *any* time and watch your troubles and tensions evaporate like morning mist in the golden sunshine of the world's year-round vacation capital!

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Look at amazing Industrial Miami while you're here. Fastest-growing U. S. Metropolitan area. Manufacturing and distribution center for "next door" Latin America. Agricultural market place. U. S. leader in air transport. Population of 400,000, expecting 600,000 by 1951. Spending $700,000,000 to build for a bright future. Going places, and inviting you to come along!

Come along with

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Please send new Miami folder.

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Last year we added more than 10,000 new telephones every working day. We're doing even better than that now.

More than 6,000,000 telephones—including many for your own particular friends and neighbors—have been added in the last two years.

Nowhere in the world do people get so much for their telephone dollar as right here in this country.

BELL TELEPHONE SYSTEM

All over America the word for style is Studebaker

PRESENTING

New 1948 Studebakers

TIME flies faster than most of us realize. It's just a little more than eighteen months since you first read the thrilling Studebaker announcement, "Your postwar dream car is here and in production!"

Now the 1948 version of that dream car has arrived. New 1948 Studebakers, with glamorous new Champion and Commander convertibles in the vanguard, are swinging upon the scene at dealers' showrooms.

They're more than fresh 1948 interpretations of the "new look" in cars that's a Studebaker style mark. They're the dramatic encore to over a year and a half of the most sensational new-car success in motoring history.

Riding low, wide and handsome straight into the heart of discriminating America, Studebaker styling has established the design pattern for all truly modern cars.

See these newest and finest of Studebaker's postwar achievements at your first opportunity. They're superb 1948 examples of the new kind of motoring in which Studebaker so impressively and so inspiringly leads.